1993

An assessment of Iowa agriculture instructors' needs for technical inservice education and curriculum materials

Roger Graham Roe
Iowa State University

Order Number 9405061

An assessment of Iowa agriculture instructors' needs for technical inservice education and curriculum materials

Roe, Roger Graham, Ph.D.

Iowa State University, 1993

U·M·I
300 N. Zeeb Rd.
Ann Arbor, MI 48106

An assessment of Iowa agriculture instructors' needs for technical inservice education and curriculum materials

by

Roger Graham Roe

A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY

Department: Agricultural Education and Studies
Major: Agricultural Education

Approved:

Signature was redacted for privacy.

In Charge of Major Work

Signature was redacted for privacy.

For the Major Department

Signature was redacted for privacy.

For the Graduate College

Iowa State University
Ames, Iowa

1993

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I. INTRODUCTION

Problem Setting

Agricultural education instructors need assistance as they continually strive to remain technically up-to-date. Rapid developments in biotechnology, genetic engineering, international marketing, plant technology and advanced breeding methodologies have changed the face of agriculture. Aquaculture, biomass culture, hydroponics and other specialized production systems are relatively recent agricultural introductions. These new technologies require a pool of skilled workers who can assume responsibilities in the industry (Neason, 1992; National Council on Vocational Education, 1990). The rapid advances in technical agriculture make it important that students be prepared for the workplace of the future. Essential to a prepared student is a prepared teacher. Teachers must have sufficient knowledge and skills to teach these technologies (Neason, 1992).

As technology develops in agriculture, concerned and dedicated agricultural teachers have a need for programs that will enhance their knowledge and skill. These can be provided by teacher inservice workshops and other programs such as technology update seminars. A well developed inservice program can do much to sustain and enhance the competency of the teacher.

An area of concern to teachers is an inadequate background in sciences to teach the new biotechnology skills; this is particularly so with teachers who graduated some time ago. These teachers must be given

an opportunity to develop new skills to enable them to prepare their students for biotechnology positions in the future. Researchers have found that teachers in North Carolina felt a lack of teacher knowledge was a barrier in teaching biotechnology (Kirby, 1990). Iverson et al. (1991) in a tri-state assessment of high school agriculture teacher attitudes toward biotechnology found that teachers had a high level of interest, but perceptions of limited knowledge.

Need for the Study

Educators have many avenues open to them as they strive to remain current with advances in technology. Perhaps the method most frequently considered is inservice training, consisting of workshops and classes offered by educational institutions. In 1992 the National Council of Agricultural Education (The Council, 1992) began offering the "Professional Growth Series." Teachers could subscribe for written material and an inservice workshop in any of five current technical updates. Also the National Vocational Agriculture Teachers Association conducts workshops sponsored in cooperation with the National FFA and various commercial sponsors (NVATA, 1993). Additionally, teachers remain current through interaction with colleagues, and through agricultural industry magazines. Another way in which an agricultural education instructor keeps current technically is through involvement in an agricultural enterprise such as living on and managing a farm or acreage or part-time work in an agribusiness. Other avenues open to educators

are membership in professional associations, association journals, and meetings.

Of interest to program planners is the effect of attending inservice training on the rate of implementation of new instructional materials. A study of Iowa high school agriculture teachers found that teachers who attended the inservice implemented a new horticultural instructional unit into their classes over twice as often as teachers who did not attend (Gamon and Burton, 1987).

There are several things to consider when planning an inservice program. It is important to present material for which the inservice participants have expressed a need (Caffarella, 1982). Also of importance is the time and place of the inservice meeting. What is the effect on participation if meetings are not presented at a time or place convenient for teachers to attend? Are there formats or length requirements of the information presented? These and similar questions are of concern to the educational program planner. It is necessary to assess needs and concerns of the agriculture secondary and post-secondary teachers before making decisions on delivery, content and form of educational programs. In order to satisfactorily plan an inservice program it is essential that a needs assessment be conducted, a needs assessment allows us to work towards desired goals (Smith and Roth, 1989).

In addition to determining the areas where agriculture teachers need training, and the best time and location for inservice meetings, a needs assessment can also assist in determining other teacher needs. Assessing

the need for additional curricula materials and lesson plans would be useful for program planners. While it is important that inservice training programs be planned and offered to agriculture teachers they must also have current teaching materials. With the rapid advances of technology, lesson plans and materials can become outdated, creating a need for revision, or in the case of new technologies entire teaching programs must be developed (Smith and Roth, 1989; Phipps and Osborne, 1988).

Perhaps in terms of the efficacy of any training program the needs assessment best facilitates experiential learning. What this means is that the participants are involved in helping to plan their own educational experience, an integral part of experiential learning theory.

> Experiential learning theory provides a framework for examining and strengthening the critical linkages that can be developed among education, work, and personal development (Kolb and Lewis, 1986, p. 99).

Involving agricultural teachers in the process of developing their training programs results in closing the loop in traditional educational processes, namely the personalization of knowledge (Kolb and Lewis, 1986).

Modern thoughts on adult education were sparked twenty years ago by Malcolm Knowles (Feuer and Geber, 1988) with his unifying theory of adult learning, or andragogy. Knowles, however, was not the first to use the term andragogy or to introduce the idea of a distinctively adult sort of learning. The term andragogy was first used in Germany in 1833 and has

been used extensively since then. In 1927, Martha Anderson and Eduard Lindeman used the term in their book Education Through Experience while a contemporary John Dewey proposed the merits of experience-based and self-directed learning (Feuer and Geber, 1988).

> Essentially, what Knowles said in The Modern Practice of Adult Education: Andragogy Versus Pedagogy was this: Adults have a deep psychological need to be self-directing; their experiential base is a rich resource for learning; their readiness to learn is linked to what they need to know or do in order to fulfill their roles and responsibilities as adults in society; and their orientation to learning is problem-centered (that is, adults seek knowledge and skill they can apply to the real-life problems they face, whereas kids strive for mastery over given content areas in order to get passing grades in school) (Feuer and Geber, 1988, p. 32).

A decade later, Knowles added one more characteristic of adult learners. Motivation to learn is more likely to occur internally with a need for increased self-esteem, rather than from external rewards such as pay raises and promotions. Differences between learning styles of adults and children have implications for teaching practices as they pertain to inservice training programs (Feuer and Geber, 1988).

Caffarella (1982) also stressed the necessity for conducting a needs assessment during the program planning process. Identification of educational needs is an important step in designing educational programs. A needs assessment is a systematic way of determining educational needs. There are two basic types of educational needs: prescriptive and motivational. A prescriptive need is usually organizational in origin. A motivational need is a deficiency in a specific individually defined

goal. Of the many steps in the needs assessment process perhaps the most important one is the decision to complete a needs assessment (Caffarella, 1982).

Results of a needs assessment with agriculture teachers could provide assistance to the following groups. It would enable inservice program planners with the Iowa Department of Education and the Department of Agricultural Education and Studies at Iowa State University to address the needs of Iowa agriculture teachers. These departments have maintained close ties in the development of inservice programs, particularly with the on-campus offerings during the summer. This study would assist Iowa State University in providing Iowa secondary and post-secondary agriculture teachers with inservice programs that would more precisely meet their needs.

The assistance provided by Iowa State University comes as a part of it's commitment as a Land-Grant Institution. The Land-Grant universities around the nation have a commitment to teaching, research and service. The Land-Grant Colleges were established by the 1862 Morrill Act, a most significant piece of legislation regarding agricultural education (Blackburn and Vist, 1984). Service to the people of Iowa occurs in the form of outreach and extension education. The university, through inservice education, provides outreach services to the agriculture teachers of Iowa. This commitment to the triad of teaching, research and service has been reiterated many times, most recently by Dr. Martin Jischke, President of Iowa State University.

Statement of the Purpose of the Study

The purpose of this study was to assess the inservice educational needs of Iowa agricultural education instructors. The study was designed to assess possible delivery methods, location, content, and format of future programs as well as needs for curricular materials.

Objectives of the Study

To accomplish the stated purpose of determining the needs of agriculture teachers, the following objectives were established:

1) To determine the needs for additional training in technical skills.

2) To determine the needs for new or additional curriculum materials.

3) To identify the types of curricular materials most needed.

4) To identify reasons for non-participation at inservice programs.

5) To determine instructor preferences in selection of time schedules, location, and format of future inservice programs.

6) To determine if there were differences or relationships between instructor needs and selected demographic variables.

Null hypotheses

There were no significant differences (alpha=.05) between secondary and post-secondary instructors as related to:

1. Inservice needs in technical agriculture skills.
2. Needs for new curricula materials.

3. Instructor reasons for not having attended previously scheduled inservice programs.

4. Instructor preferences for future inservice scheduling.

Also, there were no significant differences when the above were compared using instructor contract length, school location by district, and school size.

Statement of Assumptions and Limitations

The following assumptions were made in this study:

1) Instructors need assistance in remaining current with new technologies.

2) Inservice programs are expected to be a useful source of information, and to provide agriculture instructors with skills they can utilize in the classroom.

3) The data reflect the true opinions of the respondents.

4) Results will be limited to the population being studied.

5) Results were obtained from a set of responses to a structured questionnaire.

Definition of Terms

Terms used in this study were defined as follows:

Agricultural Education: The instructional areas of vocational education in agriculture. This can also refer to college or university curriculum planned to prepare and assist educators who teach agriculture (Knebel and Richardson, 1982).

Agricultural Education Instructor: In this study the term is used to include the teacher of vocational agriculture at the 9th through 14th grades, or secondary and post-secondary education.

FFA: A national organization for students enrolled in secondary school agriculture programs, it was incorporated in 1944, having been founded in 1928. It is an integral part of the high school agriculture program, providing students with valuable learning experiences (Phipps and Osborne, 1988). Members take part in and conduct meetings, participate in public speaking, contests, and community betterment projects. They are also exposed to cooperative efforts, while at the same time earning awards and recognition (Phipps and Osborne, 1988).

Inservice Education: Education programs designed to improve the teachers' knowledge base by developing technical subject-matter competencies. Delivery methods include meetings, workshops, satellite programs and seminars. Inservice programs allow the employed teacher to keep abreast of change. Inservice education takes place in a structured setting that enables teachers to remain professionally competent (Smith, 1985).

Vocational Agriculture: A program in agricultural education designed to offer students at the secondary level the opportunity to explore and prepare for agricultural occupations. Post-secondary and adult programs are recognized as legal components of vocational agriculture. Secondary teachers participating in this study taught at Iowa high schools, while post secondary teachers participating in this

study taught at Iowa area community colleges (Knebel and Richardson, 1982).

Summary

Rapid advances in technical agriculture make it important that students be prepared for the workplace of the future, essential to a prepared student is a prepared teacher. Inservice technical update programs can assist the teacher as they strive to remain current. For the inservice program planner a needs assessment can help identify the educational needs of the agricultural education instructor. This study was designed to assess those needs and to provide guidance to program planners with the Iowa Department of Education and the Iowa State University Department of Agricultural Education and Studies.

CHAPTER II. REVIEW OF LITERATURE

The purpose of this study was to assess the inservice educational needs of Iowa agricultural education instructors. The study was designed to assess possible delivery methods, location, content, and format of future programs as well as needs for curricular materials. The study focused on needs related to technical update and evaluated both secondary and post-secondary institutions.

The first section of this chapter will look at the major concerns of agricultural education today. The second section will consider the need for, and the importance of, technical update inservice education and the means of providing it. The next section will review inservices provided by Iowa State University, Department of Agricultural Education, as well as other studies conducted with Iowa vocational agriculture instructors as subjects. The fourth section will consider recommended procedures for conducting needs assessments by mail, and finally, the last section will look at the development of successful questionnaires that accomplish the task of determining instructor needs.

Major Concerns of Agricultural Education

Concerns for agricultural education today may be expressed in several ways. One concern is that agricultural education should create a better understanding of agriculture and the worldwide challenge presented to our young. Another area of concern is the fact that many rural schools do not offer agricultural education. Successful programs can

lead to a far wider range of career opportunities than in the past (Phipps and Osborne, 1988; Hook, 1992).

> The purpose of instruction in agriculture should be that of educating students about agriculture: the importance and contributions of agriculture to society, the development of practical agricultural skills, and the preparation of people for occupations in agriculture. Instruction in agriculture must be broadened to include instruction in these areas if it is to make a significant contribution to society and address specific learner needs in the years ahead (Kahler, 1988, p. 3).

The needs of agricultural education have been met in the past with the help of concerned educators. The passage of the Smith-Hughes Act in 1917 occurred in response to the advocacy of educators and the Department of Labor (Kahler, 1988). Funding was provided to the states and local schools to provide practical education courses in the hope that such education would increase the economic and social efficiency of the nation. Although the Smith-Hughes Act established vocational education it was established without a clear philosophical basis for the program. The lack of a philosophical base made it difficult at first for vocational education to establish itself in the school curriculum. The school curriculum at that time was charged with providing a broad general education for students and the idea of providing practical technical education met with resistance. However, in spite of the doubters who felt that there was no place for vocational education in the schools, the fact that federal funds were available led to the growth of vocational agriculture in the school curriculum (Kahler, 1988).

Congressional action during the '60s expanded vocational education's role and scope, bringing area vocational schools into being. In 1963, the Vocational Education Act was signed by President Johnson. Amendments to the Act in 1968 provided greatly increased funding. In 1984, the Carl D. Perkins Vocational and Applied Technology Education Act established funding to focus on improving vocational education, and also on serving special populations. The law was re-authorized in 1990 bringing the largest ever funding for vocational education, with a major portion of funds earmarked for "tech prep" programs and to provide greater opportunities for the disadvantaged (Barlow and staff, 1992).

Since the signing of the Carl D. Perkins Vocational and Applied Technology Education Act of 1990 discussion centered on tech prep. The Act provided grants to consortia of local education agencies and post-secondary institutions for tech prep demonstration programs. The tech prep/associate degree was designed to reach beyond traditional 2+2 programs in two ways. Firstly, by containing a common core of required mathematics, science, communications, and technologies designed to lead to an associate Degree in a specific skill field. Secondly, students should be prepared for jobs requiring advanced technical skills. The 2+2 program was designed to link the last two years of high school with the two-year postsecondary program. While duplication of courses was eliminated most often those courses were not replaced with advanced skills courses at the postsecondary level (Hull, 1991).

The goal of the 1917 National Vocational Education Act was to educate American youth for careers as productive farmers and ranchers.

Today, total agricultural production is more than two and a half times as great as it was in 1930; however, the number of American farmers had decreased to two million in 1987. Agricultural productivity has increased three times as fast as industrial production in this country (Hook, 1992). Productivity on a full-time farmer basis would be much higher than this, as the USDA defines a farmer as one who markets $1,000 of agricultural produce per annum. It is obvious that many of the two million farmers must be part-time farmers. According to U.S. Census data, only 43% had no off-farm employment, 19% worked up to 199 days a year and 38% worked over 200 days per annum (Leuning and Jones, 1989).

Hook (1992) felt that a successful agricultural education program could create a better understanding of this industry that employs more than twenty-one million Americans. It should educate young people to understand the worldwide challenges that agriculture faces in the future. There is no longer the emphasis on the traditional farm-shop skills of welding and mechanics. Instruction now centers on animal science, genetics, agronomy, commodity marketing, and computer functions, and is related to many careers beyond production agriculture. A successful agricultural education program may lead to careers in floriculture, soil and water management, outdoor recreation, natural resources and wildlife management, horticulture, and agribusiness.

Phipps and Osborne (1988) expressed concern that many rural schools did not offer agricultural education, but felt that there was opportunity for growth of agricultural education in urban areas. For example, the Los Angeles Board of Education planned facilities for practical arts

agriculture in each new junior high school; due to this policy agricultural education grew rapidly. Agriculture programs in urban areas produce a graduate educated in agricultural sciences. Off-farm occupations in agriculture require knowledge and skills in agriculture and thus add to the opportunity for growth in agricultural education.

Current developments in agricultural education are a result of an increasing interest in broadening vocational agriculture to cover areas other than traditional agriculture. These developments in biotechnology, genetic engineering, international marketing, plant technology and advanced breeding methodologies have changed the needs in vocational agriculture. Aquaculture, biomass culture, hydroponics and other specialized production systems are relatively recent agricultural introductions all requiring new skills. The increase in the need for technical agricultural skills has increased dramatically, and agricultural education has risen to meet those needs. Agricultural education programs must have high standards if they are to meet the demands for farm and agribusiness workers in the future (Phipps and Osborne, 1988).

While teaching technical skills is an important aspect of the academic side of vocational agriculture, another aspect of the successful agricultural education program is the FFA. The FFA is a national youth organization with more than four-hundred thousand members that promotes leadership, citizenship and self-improvement through contests, programs, activities and scholarships. A successful FFA chapter depends not only on the members but on the abilities of the agricultural education

instructor. This instructor must also have the abilities to combine academic work with SAE or supervised agricultural experiences in order to have a successful agriculture program (Phipps and Osborne, 1988).

There are two meanings of education; generally speaking it means the process of bringing out the natural talents of a person, and developing that person to the fullest extent possible to enable them to live a complete and happy life, and to make some contribution to human achievement. In this concept of education, one is taught how and where to find information, how to develop that information, and how to put that information to use. The older and more popular meaning of education is the process of instilling in the learner the knowledge, experience, skills and moral values of society. This ensures that civilization progresses by building upon the foundation of earlier knowledge. The first people on earth must have taught their children how to procure food to eat, how to protect themselves from dangers and the elements, and other essentials to survival (Abdul Haq, 1969).

Involving agricultural teachers in the process of developing their training programs results in closing the loop in traditional educational processes, namely the personalization of knowledge. Experiential learning offers even greater opportunities by closing the loops between experience and concepts. Learners are allowed to discover how to learn from their own experiences and thus to shape their own development. By encouraging personal action, learners commit themselves to the idea; they accept responsibility for the choice of that idea and therefore learn the skills necessary to use it. Activities should have the learner apply

knowledge and skills to solve problems. Information sharing should be centered on what is necessary to plan, schedule, write, and prepare presentations in order to finish a task. Responsibility for the outcome is left to the learners who must judge their own performances using valid professional criteria (Kolb and Lewis, 1986).

In addition to the importance of involving adults in planning their education, other aspects of adult education are also important to in-service program planners. Upon entering the learning situation approaches should be used to help bring out their belief systems, theories and ideas. Views are exchanged as learners respond to each other, while at the same time they share their personal needs and perceptions. This participation will allow agriculture instructors to test their assumptions on new or refined knowledge before integrating what they have learned into their own curriculum (Kolb and Lewis, 1986).

> Adults demand relevance and seek opportunities to test ideas against their own accumulated experience. Impatient with teaching that seems remote from the realities they face, adults need assurance that their time is not being wasted. The realism of experiential and simulation teaching techniques brings out an element of excitement and is an active way of learning (Kolb and Lewis, 1986, p. 105).

Modern thoughts on adult education were sparked by Malcolm Knowles with his unifying theory of adult learning, or andragogy (Feuer and Geber, 1988). While his ideas created a revolution in adult education and training, Knowles, however, was not the first to use the term andragogy or to introduce the idea that adults had their own particular

style of learning. The term andragogy was first used in Germany in 1833 and has been used extensively since then, particularly in France, Holland and Yugoslavia. In 1927, Martha Anderson and Eduard Lindeman used the term in their book Education Through Experience while a contemporary John Dewey proposed the merits of experience-based and self-directed learning (Feuer and Geber, 1988).

Essentially, Knowles observed that adults must be allowed to practice their need to be self-directing. This is certainly true for agriculture instructors as their experiential base can be a rich resource for learning. The instructors' readiness to learn is linked to what they need to know or need to do so that they may fulfill their roles and responsibilities as teachers of agriculture. These adult learner traits should be understood by the inservice program planner as they strive to produce programs that are well attended and productive. Agriculture instructors orientate their learning to problem-centered needs, that is, they seek knowledge and skill they can apply to the real-life problems of modern agriculture. A decade later Knowles added one more characteristic of adult learners. He stated that a motivation to learn is more likely to occur internally with a need for increased self-esteem, rather than the external rewards of pay raises and promotions (Feuer and Geber, 1988). Differences between learning styles of adults and children have implications for teaching practices as they pertain to inservice training programs.

Continuing education program administrators should expect inservice participants to make commitments for change in their own teaching. An

effective way to improve teaching performance is to help teachers identify aspects of their teaching role where they have questions to be answered, problems to solve, and opportunities to pursue (Knox, 1980). This is more productive than the more normal inservice education which consists of distribution of materials or presentation of information about content, learners, and instructional methods. The successful administrator recognizes that a single workshop is likely to have little impact on staff development (Knox,1980). Improvement requires persistence in the total learning activities. For this to be accomplished teachers must be committed to the importance and feasibility of the staff development program. This requires much self-direction as effective teaching requires content mastery and adaption of concepts. Self-directed learning by teachers facilitates adaption far more than standard staff development sessions. It should be remembered that active questioning and inquiry benefits both the teacher and their students (Knox, 1980).

In the theories just discussed, we can see the importance that a well developed inservice program, based on adult learning styles, can play in maintaining agriculture instructors technical knowledge and skills. The need for continuing education is self-evident as the rapid advance of world knowledge continues unabated. Programs that enhance these teacher abilities have been developed within the Iowa Department of Education and by Iowa State University. These inservice programs are a part of the commitment that Iowa State University, as a land-grant institution, has toward teaching, research and service. The Land-Grant

Colleges were established by the 1862 Morrill Act, perhaps one of the more significant pieces of social legislation in U.S. history. It was also one of the most important pieces of legislation regarding agricultural education (Blackburn and Vist, 1984).

Prior to the 1862 Morrill Act three states had passed acts providing for agricultural colleges. Iowa was one of these states, having passed legislation establishing an agricultural college on the 22nd of March, 1858. The land-grant college mission of teaching, research and service also has a moral basis. When government began using tax revenues contributed by all of the people to support college education it had a moral obligation to return to all of the people the practical benefits of such efforts. This is founded on the ideal that people have an inherent right to participate in the benefits derived from what they create and support. The government has the obligation to make available to the people these practical benefits since all cannot go to college. This obligation is one of the reasons for off-campus service work (Bliss, 1960).

Service to the people of Iowa occurs in the form of outreach and extension education. The university, through inservice education, provides outreach services to the agriculture instructors of Iowa. This is carried out by the Department of Agricultural Education and Studies by attempting to upgrade the professional and technical competencies of agriculture instructors. Barrick (1982) stated that one of the responsibilities of the agriculture education department was to identify relevant topics for teacher inservice programs. While this is done by

assessing the needs of the teacher, societal needs for the future must also be taken into account. Competency lists have been developed in order to delineate the societal needs of concern to the agricultural educator.

Many state vocational education departments have developed prescribed competency skills that students must demonstrate while in a vocational agriculture program. State departments of education have developed these in response to state legislation. Iowa has also developed prescribed agriculture competency lists (Iowa Dept. of Education). These competencies cover minimum skills in each of six areas, skills that students must be able to demonstrate at the completion of instruction in that area. These areas currently consist of the following: 1) Agricultural business, service, and supply; 2) Agricultural production; 3) Agricultural mechanics; 4) Horticulture; 5) Agricultural products and processing; and 6) Natural resources. Other occupational areas in agriculture include forestry which is often included in agricultural instruction. Iowa, however, has not developed competencies for forestry.

State-prescribed competency requirements developed as a response to legislation are a result of societal needs. One group having input into the curriculum area is business. Business is beginning to exert pressure to improve the quality of school graduates. For some time business has complained that graduates cannot perform simple math functions, generate correspondence, or perform many simple tasks critical in today's world. Businesses have had to develop remedial classes in the workplace to

enable new employees to perform their jobs. Business has now become involved in education, particularly curriculum, at the state level. They have expanded their concern from the cost of education and taxes, to a concern about the quality of the school graduates entering the work force (McNeil, 1990).

The role that society plays in the curricula comes from many directions. Sociologists have long thought that curricula could mold, and with social control, make for a better society. They have used it to indoctrinate new immigrants with the values which they thought were most important. There were two schools of thought among sociologists in the early 1900's. Edward A. Ross and others stated that the interaction between society and the individual was one directional, that is, from society to the individual. Charles Horton Cooley and others felt that the relationship was reciprocal (Franklin, 1986). They thought that the recipient was not only a product of their culture, but that they played an active role in developing that culture. Curriculum was more than just a course of study within the schools, it was also an important artifact of our culture. Found within the curriculum were some of the ideas that defined the nation. The curriculum could tell what the nation wished to carry forward, and also expressed concerns about things in society that people wished to eliminate (Franklin, 1986).

Concern about government control over education, and by extension, over curriculum, caused the Reagan administration to propose the abolition or downgrading of the Department of Education. According to Butler et al., (1984) they wanted to break the stranglehold of

centralized special interest control over educational policy, and to return responsibility for education to the states and localities. This goal, along with the school prayer issue, was not resolved satisfactorily.

It was felt by the Reagan administration that a suitably reformed department would have three branches; the first would disburse funds, the second would perform statistical analysis to determine how education was doing, and the third would house a "bully pulpit," a platform from which to propose ideas that would be widely publicized. Ideas would be presented on values and curricular content, and "moral pressure" for school reform could be mobilized (Butler et al., 1984).

Who shapes the curriculum is of constant concern. Professional educators consider the curriculum to be a professional matter. However, this does not shield them from the desires of society for topics including religious training, Americanization, and occupational training. Composition of the school district populations and their values create differing concerns. Lack of agreement on the content and intellectual level of the curriculum between professionals, and state and local authorities is thus not surprising (Kirst, 1984).

At the local level, school boards, teachers, administrators, and parents often change the curriculum to fit local values. Local opposition can be great, particularly when it involves topics such as evolution, the United Nations, the role of racial minorities, and the social nature of humankind. These have all aroused controversy. Local people have sought to block state directives or professionally accepted

norms of curriculum. During the last two decades local control has become a major issue; in many cases this control has led to book bannings. In Warsaw, Indiana, the school board president posed the question of who should control the minds of students following the banning of books. These new ideas about instructional materials form part of the general challenge of the professional hold over school policy (Kirst, 1984; Wirt and Kirst, 1982).

Central control of the schools is concerned with equal treatment, freedom of choice, and efficiency. Only the state can ensure equality and standardization of instruction. However, local control assures programs that work efficiently and effectively in local classrooms with local children. To move local schools toward higher academic standards reliance cannot be placed upon curricular mandates and tests. It is up to local forces to take steps to raise academic standards rather than reacting to mandates from above (Wirt and Kirst, 1982).

The book "Why Johnny Can't Read" published in 1955 became a rallying point for parents in their efforts to reassert control away from the experts. The desire of parents to control the education of their children is deep-rooted in American society. Publication of the book influenced the reading curriculum. It proved to the conservatives that the country was going soft; they felt it was due to the progressive educational curriculum. This led to the call for a return to the basics. It also had a profound effect on the publishing industry, eventually leading to many innovations in beginning reading programs (Popkewitz, 1987).

In the 80s, the role of the local school board and the public was minimal. In most cases, they knew little about curriculum, leaving most planning to professionals or the state. The state influence increased over the decade of the 80s, mainly as a result of the fiscal control exerted. The state's ability to regulate teachers, mandate testing and require certain texts left local boards little choice. Standardized tests for college admission resulted in a national curriculum (McNeil, 1990).

Importance of Technical Update Inservice Education Training

There are many reasons for inservice training, and while these may differ among teachers, some are the same in all states and countries. In a study of vocational agriculture teachers conducted in Kware State, Nigeria, Abolaji and Reneau (1988) reported that eighty-six percent (86%) of respondents stated that the most important needs for inservice training were as follows: 1) increase knowledge of agriculture, 2) update and keep current in agriculture, and 3) increase professionalism. One concern for inservice planners was poor attendance at inservice programs; 50% of teachers responding to this study reported that a lack of funding from the school was the main cause of non-attendance. No or late information, 27%, and unsuitable time, 16%, were the next most frequent reasons for non-attendance.

Gamon et al. (1992) stated the importance of knowing the needs of personnel when developing a training program. Without knowledge of those needs educational planners may impose their own perception of need.

Educators have considered a needs assessment is essential if the needs of learners is to be met.

Grieshop et al. (1990) found that important differences often occur between what people want to know and what they need. There are also differences between what people think they need and what educators feel they need to know. Educational planners must take this into account when developing inservice technical training programs. Conducting a needs assessment of teachers can provide us with a starting point, that of the teachers' perception of need.

Gamon and Burton (1987) conducted a study to determine the difference in the implementation of an instructional unit between instructors who attended an inservice program and those instructors who did not attend. They found that teachers who attended the inservice program implemented the new instructional unit into their regular classes over twice as often as teachers who did not attend. Teachers who chose not to use the new material identified two main reasons: (1) other topics deserved higher priority, and (2) the teacher was not knowledgeable enough to teach the subject. Teachers also identified a lack of relevant instructional materials as a major contributing factor in their decision not to teach the unit.

A survey made in Great Britain by Beetlestone and Teasdale (1984) on biotechnology awareness among school teachers concluded that while many teachers appreciated the potential economic importance of biotechnology and had an interest in incorporating it into their classes, few had the appropriate training or experience to do so.

Osborne and Miller (1985) in their study of livestock skills among Ohio agriculture teachers found that teachers with a high level of ability were more confident, and demonstrated those skills more frequently. They also found that confident teachers used live specimens and allowed students to practice newly learned skills more frequently. Lack of confidence resulted in the teachers not demonstrating the skill, or not allowing the student to personally practice.

In addition to the traditional teaching materials used in the vocational agriculture classroom over the years, the computer and video cassette recorder (VCR) technology have become important components in the classroom of today. In their study which evaluated five years of annual instructional materials packets, Bekkum and Hoerner (1992) found that the videotape was the most useful item in each year's packet. They reported that teachers anticipated increased use of VCRs in the future.

A study of Extension horticulture clients related to program delivery methods found that master gardeners and commercial horticulture respondents rated videotapes as the second most important source of information after bulletins. Meetings, television, and friends and neighbors rounded out the top five sources. Roe (1990) stated that videotapes had implications for future delivery of information and training.

Decker and Merrill (1990) reported in a study by Cornell University that dairy farmers liked the use of a videotape as part of a workshop. Furthermore, the videotape program led to improvement in knowledge and a change in attitude among farmers. This in turn led to substantial

on-farm changes in milking procedures. Subsequent viewing by the farmer at home was found to reinforce the information. Immediate response by the farmers following viewing indicated that 71% were considering changes in milking practice. A three-month follow-up of 33% of the farmers found that 87% of them had changed one or more milking practices. The number of practices changed or adopted averaged 2.4 per farmer.

In a creative component study at Iowa State University in 1987, it was found that Master Gardeners were satisfied with the delivery of portions of their program by satellite telecast. Almost 90% indicated they would be willing to attend satellite telecasts in the future (Eckles, 1987).

Based on these studies it is apparent that some of the newer techniques of information transfer can be used in inservice training. This is particularly important as Iowa completes the fiber optic network and as many schools prepare to link-up with that network. It should be kept in mind that adults enjoy and benefit from a variety of teaching techniques and the following should be considered when developing inservice teaching strategies. In order to develop inservice programs that will be acceptable to agriculture instructors, they should be involved in choosing the technique. Real life or simulated learning experiences will create inservice programs that will be seen as being more relevant. The inservice will create greater interest, and provide long-term learning if participants are involved mentally, emotionally, and physically. The use of ego involvement will improve motivation and learning if the participants have a felt need or interest in the

information. If teachers are allowed to experience success they will find their self-esteem and motivation will increase. An inservice program should develop skills for independent learning; providing pleasure in the learning situation will help ensure a desire for continuing learning (Mitchell and Corby, 1984).

Neason (1992) conducted a study of Louisiana agriscience teacher inservice needs believing that inservice workshops were effective in updating teacher skills. Studies by other researchers found that teachers, particularly first year teachers, perceived inservice workshops to be the most effective means for learning (Kirby, 1990; Birkenholz and Harbstreit, 1987). This Louisiana study determined demographic characteristics, preferences in selection of time schedules, and types of presenters for future inservice programs. Neason approached a need for inservice assistance based on the respondents' self-rating of their knowledge and skills in selected curriculum skill areas. In a critique of this study, Miller (1992) raised concerns of the use of knowledge and skills to determine need. A respondent may have knowledge and no skill, or skill and no knowledge, or have neither. One of the reviewer's major concerns was with the theoretical definition of what constituted a need. Most definitions of need include a component of the discrepancy between an existing state or level of knowledge and a desired state (Miller, 1992). Given that definition of need the reviewer did not see the operational definition of a need in the study.

Iowa State University Inservice Programs

The Department of Agricultural Education and Studies has departmental records of inservice programs for Iowa agriculture instructors going back to 1975. This section will consider those over the past five years. The information presented in this section is drawn from departmental file records (Ag EdS, 1993), which indicate that workshops have been conducted over many areas of the agricultural curricula. Iowa State University and the Iowa Department of Education were involved with the National Council Professional Growth Series in delivering inservice training for the five training packages offered. In 1992, inservice workshops were conducted for the Ag Sales package (NVATA, 1993).

At the 1992 summer inservice day held in Ames workshops were conducted as follows: 1) Forage testing & ISU research tour; 2) Embryo transfer technologies; 3) The germ plasm bank at the Plant Introduction Center; 4) Value added grain/cereal crops and value added meat products; 5) Plug production from seed to six-pack; and 6) Chinese pig breeds - a valuable genetic resource. Several of the workshops were a repeat of the prior year's inservice and were included again in 1992 due to demand. This inservice day, as in previous years, followed the 1992 Iowa Agricultural Education Conference conducted by the State of Iowa, Department of Education (Ag EdS, 1993).

Workshops conducted at the 1991 inservice at Iowa State University included: 1) Genetic engineering; 2) Forage testing and research; 3) Embryo transplanting; 4) Swine nutrition research; 5) Plant Introduction

Center; 6) Value added grain and meat products; and 7) Plug production in horticulture (Ag EdS, 1993).

In 1990, Iowa State University became involved in efforts to improve instruction in agriculture business management in Iowa. These efforts included attendance by instructors from the Charles City and Riceville Community Schools who attended the National Farm and Ranch Business Management Seminar. This seminar was sponsored by Deere and Company as a special project of the National FFA Foundation. The primary task of participants was to develop a preliminary plan for improvement in Agriculture Business Management instruction in Iowa. Participants identified preservice education, inservice education, development of supplemental curriculum materials and promoting the instruction of agricultural business management competencies as key steps for improving agriculture business management instruction (Ag EdS, 1993).

In 1989, Iowa agriculture instructors established priorities in the following areas: 1) biotechnology, 2) agriculturally diversified entrepreneurs, 3) value added - agricultural processing, 4) food technology, 5) human relations, 6) nursery/landscape, 7) leadership and communication, 8) standardized agricultural curriculum, 9) agricultural sciences in vocational agriculture, 10) natural resources, 11) prevocational agricultural sciences, 12) direct marketing of agricultural supplies, and 13) small animal care/services. Workshops were planned on diversification through small animals and horses; alternative crops for agricultural diversification; and agriculture business horticultural ornamentals (Ag EdS, 1993).

The spring inservice program in 1988 covered water quality. A plan was developed for future inservices to include hay and pasture management; large engines and diesel power; and from the forestry curriculum, firewood and Christmas tree production (Ag EdS, 1993).

Recommended Procedures for a Mailed Needs Assessment

The following are examples of studies that were conducted by graduate students from the Department of Agricultural Education. These studies, which involved Iowa vocational agriculture instructors, were conducted using mailed questionnaires.

In one study, Odubiyi (1988) used a self-administered, mailed questionnaire to collect data from Iowa vocational agricultural instructors. This study focussed on the subjects perceptions of teaching methods utilized in their instructional programs. This study used a sample of 150 instructors from a population of all 268 Iowa vocational agriculture instructors. After a second mailing of the questionnaire this study reported a response rate of 73% usable questionnaires.

Another study, conducted by Daub (1990), identified the student recruitment practices of Iowa high school vocational agriculture instructors. A survey instrument was sent to the 115 randomly selected respondents. Of these 115 only the first 80 comprised the sample, the remaining 35 were identified as substitutes or backup respondents for those of the 80 who did not return their questionnaire. After a

follow-up mailing a final response of 64 of the original sample and 16 of the substitutes were received, or a final rate of 70%.

A third study by Weeks (1988) assessed the perceived quality of instruction in secondary vocational agriculture programs in Iowa by school personnel, including agriculture instructors. This study also used a questionnaire, mailed to a sample of 100 instructors with a follow-up mailing. The final response rate for the instructors was 86%.

Caffarella (1982) pointed out the necessity of identifying client needs during the program planning process. The identification of educational needs of potential participants is an important component in designing educational programs. The process for identifying educational needs is called a needs assessment, a systematic way to identify educational deficiencies or problems. In designing a needs assessment, it is important to ensure that both types of educational needs, those of the individual (motivational) and the organization (prescriptive), are addressed. Considering both needs will provide for a more effective and balanced educational program.

The steps to be followed in planning a needs assessment are important. The first step, or planning stage includes the decision to complete a needs assessment, and the identification of those individuals who will conduct it. In addition to the identification of the users and uses of the needs assessment, there should also be a description of the target population. Need identification, or the development of the focus and specific objectives for the needs assessment should take place, along with the determination of budget and time frame for the study. The next

stage is doing the needs assessment which includes the selection of design and data collection techniques, collection of data, and the analysis of data to determine needs. Rank ordering of needs allows the selection of those needs for attention. Finally, communication of those identified needs must take place (McKillip, 1987; Caffarella, 1982).

A variety of techniques can be used to determine needs and interests. They range from highly structured techniques such as mail surveys to informal discussions. Surveys can be conducted by mail, telephone or interviews. The survey is one of the best approaches to determine the needs of a broad range of individuals if time and money are constraints. If the questionnaire is properly constructed and tested, the data obtained is usually reliable and valid. Drawbacks to using this approach are: cost in both time and money, the skill needed to design a valid and reliable instrument, and the hesitation of individuals to answer surveys (Caffarella, 1982).

McKillip (1987) states that surveys are a popular method of gathering information on needs. While there are three survey methods considered for need analysis this study is concerned only in mailed surveys. Question format is very important. Ranking versus ratings formats can be used. Ratings are simpler for the respondents and allow application of advanced statistical techniques to develop an order of needs. Ranking, however, requires that some option be number one according to (McKillip, 1987). Surveys can yield useful data for need identification.

Development of Successful Questionnaires

The following are several types of information which should be communicated to the respondent to answer the question, "why respond?" Information regarding the value of the survey and the purposes for which the data will be utilized should be stated. How the community and individual respondent may benefit should also be explained. Other areas to be addressed in the communication with the respondent should cover the requirements of scientific sampling and particularly how essential a high response rate is. Finally a time schedule and a guarantee of anonymity should be stressed.

Maclean and Genn (1979) reported a traditional reluctance in Britain to the use of postal surveys, due mainly to a perceived low response rate. They stated that a review of available literature reporting methodological studies provided little clear guidance on this. A number of studies on response rate were clearly contradictory. In their reviews of the literature, it was demonstrated that the advantages of postal surveys as apposed to personal interview surveys tended to be subject-specific. In a study conducted in Bristol, England, Maclean and Genn (1979) found that the use of a postal survey obtained the following results. This survey was prepared following the guidelines for a quality mailing, namely: Printed on good-quality white stationary; stamped rather than franked; addressed personally; cover letter signed by the researcher. The survey was mailed to twelve hundred and thirty-four people. During the first twelve days following mailing a response rate of fifty-six percent was obtained, which is considered good for a general

mailing (Maclean and Genn, 1979; Dillman, 1978). Postal surveys are generally used if cost is of concern, or when it is felt that the respondents have an interest in the subject.

Alreck and Settle (1985) looked at the total process from survey planning and design through report generation. From the standpoint of needs assessment, desires and preferences are often measured by identifying and listing the possible categories that might be desired. Horizontal, numeric scales can be used to rate them. Demographic data are often valuable because demographic groups often differ significantly on the issues of importance. Demographics can be used to identify segments, groups, audiences, or constituencies of people who are both identifiable and behave in similar ways. Project planning involves the following phases; information needs, sampling design, instrumentation, data collection, data processing, and report generation.

Alreck and Settle (1985) felt that the selection of the most appropriate method for collecting the data was a key decision for the researcher. Collecting data requires contact with the respondents, and that can be accomplished by mailing them a questionnaire to be completed and returned. Mail survey data collection differs from interviewing in many important respects. The cosmetic aspects of the mailing piece must be considered carefully because its form and appearance will affect the rate of response and the quality of the data. As each respondent is presented with an identical questionnaire and exactly the same instructions and tasks the chance of interviewer bias is eliminated. The mailing piece must be constructed very carefully, and the instructions

must be clear to virtually all potential respondents. The questionnaire should be pretested to ensure its effectiveness and clarity. Data processing is best done by computer and a statistical analysis program. The nature and format of the reports should be considered in advance. The final element of the project outline is the cost schedule and timetable for the project. The important factor for the researcher to note when completing the survey plan is the necessity for an integrated project (Tuckman, 1988; Alreck and Settle, 1985).

In order to utilize the capability of the survey, the questions must be asked correctly. Vague questions produce vague answers (Dillman, 1987). Questionnaire format is equally important, for not only does the order in which the questions are asked make a difference in how people respond but whether they respond at all. The survey needs to be constructed in a way that order bias and resistance to responding are overcome. The first questions in a survey should be ones that attract interest and are easy to answer.

Fuller (1988) felt that the choice of self-administered or mailed questionnaires depended to a certain extent on the reading and writing skills of the population and their motivation to cooperate. If one is collecting data from a population that is highly literate and likely to be interested in the research, mail procedures become more attractive. With self-administered questionnaires, closed questions produce the best results, because open-ended questions lead to difficulty for the respondent in answering, and thus adversely affect the response rate. More importantly, self-administered open-answers often do not produce

useful data. Designing a good questionnaire involves the following; selecting the questions needed, testing them to ensure they can be asked and answered as planned, then putting them into a form that is easy for respondents to complete. Starting with relatively easy straightforward questions gets the respondent into the survey. It is also a good idea to reserve the difficult or sensitive questions for the middle or end of the questionnaire. Self-administered questionnaires should be self-explanatory. They should be restricted to closed-answer questions in which checking a box or circling a number is the only task required. Question forms should be few in number; the more the questionnaire can be set up so that the respondent has the same kinds of tasks and questions to answer, the easier the task will be. The questionnaire should be clear and uncluttered and the respondent should be provided with adequate information and instructions. Pretesting is critical, as virtually every questionnaire could be changed in some way to make it easier for respondents to meet the researcher's objectives. The best way to pretest a self-administered questionnaire is in person with a group of potential respondents. One outcome of the pretest should be to find out how long it takes to complete a questionnaire (Fuller, 1988).

According to Alreck and Settle (1985) effective survey questions have three important attributes, focus, brevity, and simplicity. Both vocabulary and grammar are important when forming survey questions. Is the question expressed as clearly and simply as it can be? If the meaning will not be clear to virtually every respondent, the item should be rewritten. The manner in which questions are expressed can all too

often introduce systematic bias, random error, or both. If the criteria by which respondents must judge some issue or respond to some question are not completely obvious, the criteria must be stated in the question. Leading questions, those that create a very strong bias, often result in data that are completely invalid. In similar fashion, loaded questions, those that have only one right answer, can constitute a more subtle form of influence. These biases are known as instrumentation bias; when bias is introduced because of the mentality or predispositions of respondents, it is called response bias. There are many different types of response bias; the main types are social desirability, acquiescence, prestige, hostility or order (Alreck and Settle, 1985).

Alreck and Settle (1985) make a number of recommendations regarding the construction of questionnaires. Answers to survey questions are typically a choice of position along some continuous spectrum. A response scale is merely a representation of that continuous spectrum. When creating a response scale the best guide is the philosophy of keeping it simple. Respect the respondent and select scales that will make it as quick and easy as possible. When deciding on the range it should be borne in mind that respondents normally classify into a range from two to seven or eight. Pick the denominations and group only when absolutely necessary. In questionnaire construction, emphasize the introduction, since most refusals will come immediately and once respondents begin they seldom terminate. Simple, interesting, informative items should come first and sensitive items as late as possible. Combine items that use the same scale, or cover the same topic

into sections. Finally, use ample instructions that are simple enough for the least sophisticated respondents (Alreck and Settle, 1985).

Fuller (1988) stressed that all research involving human subjects must be carried out in an ethical manner. Respondents should be given the following basic information: the name of the organization, who is paying for the research, a brief description of the purposes of the research, a statement of confidentiality and finally the assurance that cooperation is purely voluntary. In most cases, signed consent forms are not needed; consent being implied by completion of a questionnaire. One exception to this would be in cases where information is obtained that could be harmful if misused.

With mailed questionnaires the cosmetic aspect of the survey is very important (Alreck and Settle, 1985). It must do the entire job of winning cooperation, capturing the data, and returning it to the researcher. The response rate will be greatest when first class postage stamps are affixed. Response rate is least when bulk mail permits are used (Maclean and Genn, 1979). A cover letter, or letter of transmittal, must explain the project and win the cooperation of the recipient. It should answer questions likely to arise in the mind of the person who receives the letter. It should also state that the respondent is not required to complete it, that they may withdraw from the survey at any time and when any identifying numbers will be removed. Timing the mailing is important from the standpoint of possible bias, or response rate due to outside influences. The best time of the month is the middle rather than before, at, or the end of the month. Similarly the best time

of the week is the middle rather than the beginning or the end. During the period when completed returns are received it is wise to keep a complete record of how many questionnaires were sent, how many are still out at any given point, and how many have been returned (Alreck and Settle 1985).

The first step to developing a sample is to define the sample frame. The most appropriate scheme occurs when the sampling is done from a complete list of individuals in the population to be studied. Systematic samples have an advantage over simple random sampling in that it is not necessary for the list to have all the names numbered. With a systematic sample the researcher determines the number of entries on the list and the number of elements from the list that are to be selected. The decision should be made to select from the list every 'nth' name, where n is calculated by dividing the number of units in the sample into the number on the list. Dividing the latter by the former will produce a fraction, for example 1/30, which means that one out of every thirty on the list is to be sampled. In order to select a systematic sample, a start point is designated by choosing a random number from one to thirty. The randomized start ensures that it is a chance selection process, from that start the researcher takes every thirtieth person on the list. Sample size is a decision with no right answers; many methods have been used, specified percentages, statistical methods which determine estimates of sampling error, and so-called standard survey studies with specified sample sizes. A sample of one hundred and fifty will describe a population of fifteen thousand or fifteen million with the same degree

of accuracy. The response rate need only be estimated and include a sufficient number to be contacted, so that the data collection yields an adequate number of respondents to satisfy the sample size requirements. A sample of less than thirty respondents will provide little certainty to be practical; usually experienced researchers regard one hundred as the minimum sample size when the population is large. From a statistical standpoint as one increases from fifty the precision increases steadily up to sample sizes of one hundred fifty to two hundred at which point it tends to level off (Fuller, 1988; Alreck and Settle, 1985).

Once data have been collected by a survey they must be put into a form for analysis by computer. The process of coding or data reduction involves five separate phases: 1) formatting or organizing the data, 2) designing the code, the rules by which a respondent's answers will be assigned values that can be processed by machine, 3) coding, the process of turning responses into standard categories, 4) data entry, keying the data onto storage media so the analytic software can read them, and 5) data cleaning, doing a final check on the data file for accuracy, completeness, and consistency prior to the onset of analysis (Fuller, 1988). Data should be formatted according to the requirements of each analytic software package. The code is a set of rules for translating answers into numbers, it is critical that it be reliable so as to allow appropriate interpretation of the data. Codes should be assigned for missing data; don't know answers can be treated as not ascertained or as a separate category of missing data. Once data entry is complete it is most important that it be checked for legal codes and completeness.

Sight-editing of completed questionnaires should be done to determine if it is acceptable for processing. Once the questionnaires have been assembled the data should be keyed into a computer file on a disk or diskette. Once the data has been keyed to file it should always be process edited to ensure the data is clean and ready for analysis. If this is not done the analysis routines may fail to execute or if they do run may generate reports with erroneous results. Data should be checked for deviation from record format or field range. Some questions may need to be recoded if the data is to be meaningful. Examples of the need for recoding may be years of schooling or formal education. Questions to determine level of knowledge may need to have the responses reversed. Age may need to be recorded into ten year categories to enable bar charts to be printed with a more meaningful portrayal. Once data are entered the data processing or analysis can be done (Alreck and Settle, 1985).

According to Fuller (1988) researchers have a scientific obligation to provide a full description of the details of the procedures used that could affect those estimates. The following is a brief outline of information that should be reported about any survey: 1) the sample frame, sampling procedures, including any deviations from simple random sampling, 2) field results, the disposition of the initially designated sample, which describes the number of respondents, and the number of nonresponses, 3) a brief description of questionnaire design procedures, including any pretesting that was done, 4) for a major report, a reproduction of the entire questionnaire, 5) the quality control and checking procedures that were used during coding, data entry, and

preparing the data file for analysis, and 6) finally the methodological section should include information about the reliability and validity of the major measures used in a survey (Fuller, 1988). One way to measure reliability is to measure the internal consistency of a instrument (Sax, 1974).

Summary

The purpose of this study was to assess the inservice educational needs of Iowa agricultural education instructors. The study was designed to assess possible delivery methods, location, content, and format of future programs as well as needs for curricular materials. The study focused on needs related to technical update and evaluated both secondary and post-secondary institutions.

The first section of this chapter looked at the major concerns of agricultural education today. It considered the rapid growth in technology, and the importance of agriculture to the nation. Historical aspects of vocational education, adult education, and the Land-Grant university system was discussed, paying particular concern to the service aspects of the institution.

The second section dealt with the need for, and the importance of, teacher inservice technical update training and the means of providing it. It looked with particular care at the needs for inservice technical updates and the role they play in maintaining current, knowledgeable, agriculture instructors.

The third section includes a report of the contents of files covering the past five years of inservice programs conducted in Iowa by the Department of Agricultural Education and Studies at Iowa State University.

The last section of this chapter included a brief report of other research conducted using Iowa vocational agriculture instructors. The remainder of this section was concerned with what is required in order to meet the goals of a successful needs assessment study of the agriculture instructor. It is important that a needs analysis be conducted in order to fulfill those needs. A needs analysis that is effective requires a well planned survey, with the questionnaire being perhaps the most important part of that survey. This chapter considered carefully the vitally important aspects involved with creating a successful instrument. Finally the chapter looked closely at the conduct and methods that should be used in any study.

CHAPTER III. METHODS AND PROCEDURES

This chapter describes the methods and procedures used to implement the research. The decisions on appropriate methods and procedures were based on the specific objectives. The steps followed in the study were: 1) identification of population and sample, 2) development of an instrument, 3) data collection, 4) dealing with nonresponders, 5) coding of data, and 6) selection of data analysis techniques.

The research study was a descriptive one. It consisted primarily of a needs assessment, a systematic way to identify educational deficiencies or problems, as well as a way of determining educational priorities. Caffarella (1982) pointed out the necessity of identifying client needs during the program planning process.

Population and Sample

The population for this study consisted of two hundred and forty-four (244) secondary agriculture instructors and eighty-two (82) post-secondary agriculture instructors. Mailing lists for these two groups were available from the Iowa Department of Education. The mailing lists were alphabetized by school district and in the case of post-secondary institutions by their state assigned number. The State of Iowa has fifteen institutions within the Division of Community Colleges, fourteen of which maintain agricultural education departments (Iowa Educational Directory, 1992). It was determined that the sample size would consist of fifty percent of secondary instructors and all post-secondary instructors or two hundred and six (206) in total, from a

population of three hundred and twenty-six (326). Fuller (1988) states that as the sample increases to one hundred and fifty, the more precisely it reflects the population, assuming random selection of the sample, irrespective of the population size. From one hundred and fifty to two hundred this levels off, and above two hundred no further increase in precision is noted. This allows the researcher to generalize findings to the population if adequate randomization of the sample occurred.

Development of Instrument

As this study was based on a survey of a population located throughout Iowa a mailed questionnaire was used as time and expense precluded personal contact (Tuckman, 1988). Content of the questionnaire was determined using a review of the literature and consultation with faculty of the Iowa State University.

The questionnaire was reviewed by faculty and graduate students of the Department of Agricultural Education and Studies, and two committee members from the Department of Horticulture and the Department of Industrial Technology, Iowa State University. Seventeen reviewers also completed the questionnaire. These steps were necessary as a check for validity and reliability. This review and testing resulted in several suggestions for improvement in the wording of both the cover letter and the questionnaire. Questions with possibly ambiguous meaning were reworded. The program RELIABILITY Statistical Package for the Social Sciences (SPSS) was run on thirty-six variables to test internal consistency of the items considered in the questionnaires completed by the reviewers. A Cronbach alpha score of .92 was recorded. The Cronbach

alpha composite coefficient measures the reliability of the survey, or the extent to which measurements can be depended upon to provide consistent information (Nunnally, 1982).

The first three sections of the questionnaire covered the following aspects: need for additional training and teaching materials; general perceptions of inservice; and demographics. Need was defined on the questionnaire as, "the discrepancy between an existing state and a desired state." The questionnaire used ratings based on the 5-point Likert-type scale, selection of an appropriate response, or a ranking of the three or four most preferred responses from a list. At the request of the Iowa Department of Education a fourth section of the questionnaire was devoted to school participation in FFA contests. All of these concerns were covered, together with adequate explanations of those terms which might not be clear to respondents with differing areas of interest.

A cover letter from the Iowa Department of Education was included with the questionnaire. The letter outlined the reasons for the study, the nature of participation, confidentiality, usefulness of the study, and asked for assistance from the participants.

The Iowa State University Human Subjects Review Committee reviewed the questionnaire and approved the project for this research.

Data Collection

Every other person on the mailing list of secondary instructors was identified, with the starting point randomly selected; every person on the post-secondary list was selected. The questionnaire, with the return

address on the back and postage stamps affixed, requested that the respondents fold and tape the questionnaire and return it by the 12th of February, 1993. All questionnaires were identified to permit follow-up of nonresponders. The first mailing occurred on the January 27, 1993 with a follow-up repeat mailing of a second questionnaire on the 18th of February. By the 3rd of March it was determined that all responses had been received, giving a final response rate of one hundred and nineteen (119) or fifty-eight percent (58%). All of the responses contained usable data. The number of responses returned by secondary school instructors was seventy-four (74), a response rate of sixty percent (60%). Post-secondary instructors returned forty-five (45) questionnaires, a response rate of fifty-five percent (55%). No questionnaires were returned as undeliverable by mail.

Dealing With Nonresponders

The response rate of 58%, or a nonresponder rate of 42% is acceptable; Dillman (1978) and Fuller (1988) suggest that a response rate of 56% is acceptable. Response rates can range from 35% with a general population mailing to 56% using a quality mailing survey system (Maclean and Genn, 1979). Using the Dillman (1978) Total Design Method (TDM) could produce rates as high as 75%. Dillman (1978) also suggests that questionnaire length affects the response rate, with longer questionnaires reducing it. Bekkum and Hoerner (1992) reported a 57.9% return rate, comparable to this study, in a survey of Iowa secondary agriculture instructors. As they did not generalize their study to the

population no follow-up with the nonresponders was conducted.

Researchers have in the past considered nonresponders in one of two ways. Most commonly, previous studies compared, by means of a t-test, responses of early and late responders to selected variables. If no significant differences were found the results were generalized to the population and sample (Barrick and Hughes, 1992; Miller and Smith, 1983).

However, the use of early and late responders have raised the concerns of researchers on the validity of results generalized to the population as a whole. It cannot be assumed that nonresponse is randomly distributed throughout a group. It has been shown that systematic differences can occur in the characteristics of respondes and nonresponders. It has been suggested that random telephone calls should be made to ten percent of the nonresponders with the objective of eliciting responses to a random selection of questions drawn from the questionnaire (Ary et al., 1985; Dillman, 1978).

This researcher was concerned that telephoning nonresponders violated two tenets of human subject research. Namely, the subjects had been given the opportunity of not responding when they received the questionnaire and the follow-up, and that a telephone call therefore constituted possible harassment. And secondly, that to change the mode of data collection from a mailed questionnaire to a telephone interview compromised results to the point that findings should not be generalized to the population (Borg and Gall, 1989).

It was therefore decided that a shortened questionnaire, using questions selected in a manner similar to that used in a telephonic

follow-up, would be mailed to 50%, or 44 nonresponders. The first question looked at the needs for additional training, it consisted of six items, one drawn randomly from each of the six categories of competencies (Iowa Department of Education). The second question which asked for preferred inservice delivery times was selected due to its importance to the study. The final question was selected as significantly different responses could indicate that previous nonresponse was a result of inservice attendance level. This one page questionnaire was mailed on the 2nd of April 1993, to every other nonresponder, with a randomly selected start point. Individual identification coding was then removed from the completed questionnaires. The nonresponder questionnaires were identified as either secondary or post-secondary. A total of sixteen (16), or thirty-six percent (36%), of the shortened questionnaires were completed and returned.

Coding of Data

As questionnaires were received, they were reviewed carefully for completeness. Information obtained from the questionnaires was coded by the researcher and data were transferred and stored using the central computer facilities of Iowa State University.

The accuracy of coding was determined by the row length. The row length was sixty-five columns per card, with three complete cards and one card of six columns, for a total of two hundred and one columns. In addition, those columns with a yes-no column coded as 0,1, were checked for consistent data. A random sample of entered questionnaires was

checked for coding accuracy. After the first statistical program, FREQUENCIES, was run, a final check of data entry was performed to ensure no data entry errors had occurred. Inconsistent data were not found.

Analysis of Data

Data were collected and stored in a file on the Iowa State University mainframe computer, with back-up storage on a floppy-disc. Data were analyzed using the Statistical Package for the Social Sciences (SPSS). The alpha level was set at a .05 level of significance.

The following SPSS statistical procedures were used to analyze the survey data:

1) The program FREQUENCIES was used for descriptive statistics. Frequency counts, percentages, means, and standard deviations were performed on all items in the data collection instrument.

2) The program SORT CASES BY, SPLIT FILE BY was used to split the file into two sub-groups, secondary and post-secondary respondents. This allowed further statistical analysis based on these sub-groups.

3) The program T-TEST was used to test for significant differences between the two sub-groups in their responses to inservice needs, needs for teaching materials, and demographic data.

4) The program ONEWAY was used to test for significant differences between inservice needs and needs for teaching materials where demographic data were considered.

Summary

This chapter outlined the methods and procedures used to implement this descriptive study. For this study the sample consisted of two hundred and six educators drawn from a population of three hundred and twenty-six secondary agriculture teachers and post-secondary agriculture instructors. The instrument was reviewed for validity and tested for reliability. The questionnaire was mailed to the sample, with a follow-up mailing three weeks later. The return rate of one hundred and nineteen (119) questionnaires was fifty-eight percent (58%). A response rate of fifty-six percent is considered good for a general mailing (Fuller, 1988; Maclean and Genn, 1979; and Dillman, 1978). Results from that response rate are generalizable to the population. Information from questionnaires was coded and stored on the Iowa State University main-frame computer. Accuracy of coding was verified.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS). The statistical procedures used to analyze the data included; frequency counts, percentages, means, standard deviations, oneway anova, and t-tests. A 95% confidence level (alpha = .05) was set in all tests.

CHAPTER IV. FINDINGS AND DISCUSSION

The purpose of this study was to assess the inservice educational needs of Iowa agricultural education instructors. The study was designed to assess possible delivery methods, location, content, and format of future programs as well as needs for curricular materials.

Objectives of the Study

To accomplish the stated purpose of determining the needs of agriculture instructors, the following objectives were established:

1) To determine the needs for additional training in technical skills.

2) To determine the needs for new or additional curriculum materials.

3) To identify the types of curricular materials most needed.

4) To identify reasons for non-participation at inservice programs.

5) To determine instructor preferences in selection of time schedules, location and format of future inservice programs.

6) To determine if there were differences or relationships between instructor needs and selected demographic variables.

Null hypotheses

There were no significant differences (alpha=.05) between secondary and post-secondary instructors as related to:

1. Inservice needs in technical agriculture skills.
2. Needs for new curricula materials.

3. Instructor reasons for not having attended previously scheduled inservice programs.

4. Instructor preferences for future inservice scheduling.

Also, there were no significant differences when the above were compared using instructor contract length, school location by district, and school size.

Instrument Reliability

During the development of the instrument, seventeen reviewers completed the questionniare. The program RELIABILITY Statistical Package for the Social Sciences (SPSS) was run on thirty-six variables to test internal consistency of the items considered in the questionnaires completed by the reviewers. A Cronbach alpha score of .92 was recorded. The Cronbach alpha composite coefficient measures the reliability of the survey, or the extent to which measurements can be depended upon to provide consistent information (Nunnally, 1982).

A Cronbach alpha score was also obtained on the same thirty-six variables following the receipt of the one hundred and nineteen completed questionnaires. The Cronbach alpha score obtained was .87 for the eighteen need for training variables and .92 for the need for teaching materials variables. As these Cronbach alpha scores were above .7 the instrument can be considered to provide consistent information.

Response Rate

The first mailing occurred on the January 27, 1993 with a follow-up repeat mailing of a second questionnaire on the 18th of February. By the

3rd of March it was determined that all responses had been received, giving a final response rate of one hundred and nineteen (119) or fifty-eight percent (58%). All of the responses contained usable data. The number of responses returned by secondary school teachers was seventy-four (74), a response rate of sixty percent (60%). Post-secondary instructors returned forty-five (45) questionnaires, a response rate of fifty-five percent (55%). This response rate was similar to a study involving secondary vocational agriculture teachers in Alabama, Florida, and Georgia where 57.8% useable questionnaires were returned (Findlay, 1992). In another study involving secondary instructors nationwide, a response rate of 53% was obtained with a mailed questionnaire (Birkenholz and Stewart, 1991). In yet another nationwide study involving agriculture instructors whereby the Dillman procedure was used, a 59% response rate was obtained. In this study, four mailings were sent, together with incentives, plus a follow-up phone call (Dormody, 1993). Finally, in a study conducted in Iowa of all vocational agriculture instructors a response rate of 57.9% was obtained (Bekkum and Hoerner, 1992). Based on these four referenced studies the response rate of this study was comparable, and within the norm for studies involving agriculture instructors. Follow-up of nonresponders was conducted with the use of a shortened questionnaire. The first question looking at the needs for additional training and consisted of six topics. A t-test found no significant differences in the respondents needs for training in all six topics. The second question asked for preferred inservice delivery times. Respondents requested two to three hour night meetings

during the school year, weekday workshops for one or more days in the summer, and inservices during the summer conference. These responses were the same as those given by all survey respondents, though in a somewhat different order. The final question was selected as significantly different responses could indicate that previous nonresponse was a result of inservice attendance level. The instructors responding to this shortened questionnaire reported an attendance level of 3.13, or somewhat less than 50%, this compared with an attendance level of 2.65, or somewhat less than 75% for the instructors who responded to the full questionnaire. Based on these findings the results of this study can be generalized to the population studied.

Descriptive Analyses of Instructor Characteristics

Demographic data were collected from each respondent in the study, In their responses to the questionnaire, it was found that 16, or 13.9% taught in more than one school.

Table 1 reports the length of instructor contracts. Full year contracts were held by 35.3% of respondents, while 7.8% of instructors were parat-time. In a survey conducted by the IVATA (Iowa Vocational Agriculture Teachers Association) regarding contracts of secondary agriculture education instructors, 37.5% held full year contracts and 28.2% held 11 month contracts; responses very similar to this survey (IVATA, 1993).

Data on the location of respondents' schools by district are presented in Table 2. The six districts represent the FFA (formerly

Table 1. Length of instructor contract, N=119

	Post-secondary N	Post-secondary %	Secondary N	Secondary %
Part-time	4	9.5	5	6.8
Full time 9 months	6	14.3	6	8.1
Full time 10 months	10	23.8	13	17.6
Full time 11 months	6	14.3	25	33.8
Full time full year	16	38.1	25	33.8

Table 2. Location of respondents' schools by district

		NE	NC	NW	SE	SC	SW
All respondents	N	24	20	26	14	14	16
	%	21.1	17.5	22.8	12.3	12.3	14.0
Post-secondary	N	9	9	11	6	3	2
	%	22.5	22.5	27.5	15.0	7.5	5.0
Secondary	N	15	11	15	8	11	14
	%	20.3	14.9	20.3	10.8	14.9	18.9

known as Future Farmers of America) regions within the state. The NW region held the largest number of respondents with 26, or 22.9%. The SE and SC regions were jointly the lowest in terms of numbers of respondents with 14 each, or 12.3%. Secondary instructors were almost equally

matched with the SE having the least respondents at 8. Post-secondary respondents from the SC and SW were least in number, with 3 and 2 respondents, respectively.

The population for this study consisted of two hundred and forty-four (244) secondary agriculture instructors and eighty-two (82) post-secondary agriculture instructors. The mailing lists were alphabetized by school district and in the case of post-secondary institutions by their state assigned number. The State of Iowa has fifteen institutions within the Division of Community Colleges, fourteen of which maintain agricultural education departments (Iowa Educational Directory, 1992). The sample size consisted of fifty percent of secondary teachers, or every other instructor, and all post-secondary teachers, or two hundred and six (206) in total. The sampling procedures would not have caused the difference in responses in the case of secondary instructors; however, the community colleges in the SC and SW had few agriculture faculty.

The respondents' school district size and type of institution are reported in Table 3. Respondents from post-secondary schools numbered 45, or 37.8% of the total. Of the secondary school districts the greatest number of respondents came from schools with an enrollment of 750 to 999 with 20 or 16.8% of instructors. The least number of respondents in this study came from the largest and smallest school districts.

Table 4 reports the years of teaching experience of instructors in this study. The mean was 14.2 years for all respondents with a range of

Table 3. Respondents' school district size and type of institution, N=119

	N	%
Post-secondary	45	37.8
Secondary		
> 1500	12	10.1
1000 to 1499	13	10.9
750 to 999	20	16.8
500 to 749	16	13.4
Under 500	13	10.9

Table 4. Number of years of agricultural teaching experience, N=119

	Secondary	Post-Secondary	Combined
Mean	13.0	16.3	14.2
Median	13.0	16.5	14.0
Range	1/34	1/36	1/36

1 to 36 years of teaching experience. Secondary instructors reported teaching for a mean of 13.0 years, while 39.2% of instructors had taught for 11 to 20 years. This compared to a recent Louisiana study that found the average teaching experience to be 14.2 years. In that study, 49.2% of the teachers had taught secondary agriculture for 11 to 20 years (Neason, 1992). A similar study in Ohio reported the mean number of years of teaching experience to be 14.0% (McCaslin and Torres, 1992). In a nationwide study which involved agriculture teachers, stratified proportionally by state to ensure state representation, teachers had 14.4 years of teaching experience (Dormody, 1993). In a study of Iowa agriculture instructors undertaken in 1991, the mean number of years of teaching experience was 12.9 years (Bekkum and Hoerner, 1992).

Secondary instructor teaching experience in this study was 13 years, and a previous Iowa study reported 12.9 years. Louisiana, Ohio and nationwide studies reported 14.2 years, 14 years, and 14.4 years of teaching experience, respectively. The two Iowa studies were essentially the same with the increase due to the difference in the date of the survey. Secondly, the two Iowa studies would suggest that Iowa teachers have somewhat less teaching experience than their colleagues in other states.

Seventy-seven respondents, or 67%, reported belonging to the Iowa Vocational Agriculture Teachers Association. Post-secondary instructors responses showed that only 33.3% were members. Secondary instructors showed greater participation with 86.3% membership. This compared favorably with a similar study in Louisiana where 84.5% of respondents

were members of the Louisiana Vocational Agriculture Teachers Association (Neason,1992).

Table 5 reports coaching and other non-agricultural teaching duties. Secondary and post-secondary instructors reported that 16.5% of them coached while 37.1% taught non-agricultural courses. Twenty-six or 35.1% of secondary instructors taught non-agricultural courses. An IVATA study in 1993 reported that 37.6% of respondents reported teaching non-agricultural courses (IVATA, 1993). In a similar study in Louisiana, 37.4% of instructors taught courses other than agriculture (Neason, 1992). In a nationwide study, 47.9% of instructors reported being licensed to teach non-agriculture science courses, and actually averaged teaching 0.2 classes per year (Dormody, 1993).

The findings of the Louisiana and IVATA studies were similar to this study, with the Iowa study reporting 2% fewer respondents teaching non-agricultural courses. This shows essentially similar non-agricultural teaching responsibilities for instructors in Iowa and Louisiana. However, in the nationwide study, when the number of licensed teachers is compared to the mean of non-agriculture science classes taught, approximately 9.5% of respondents were actually teaching non-agriculture science classes. Data was not available on respondents teaching other non-agricultural classes.

Agricultural instructors who farmed or had part-time work are reported in Table 6. Forty-six percent of secondary and post-secondary instructors reported farming or having part-time work. The number of respondents who reported farming or other part-time work is substantial,

Table 5. Coaching and other non-agricultural teaching duties, N=119

Occupation		Secondary	Post-secondary	Combined
Coach	N	14	5	19
	%	19.2	11.9	16.5
Teach non-ag courses	N	26	17	43
	%	35.1	40.5	37.1

Table 6. Agricultural instructors who farm or have part-time work, N=119

	Secondary	Post-secondary	Combined
N	33	21	54
%	44.6	50.0	46.0

with almost half of respondents involved in non-teaching activities. The reasons for this could be insufficient income from teaching, or sufficient free-time to allow off-campus employment or farming.

A wide range of graduate credit hours were reported by the respondents; these appear in Table 7. Hours of post-graduate credit ranged from zero to 65 hours with a mean of 22.4 hours. Data were not available on instructors actively working towards a graduate degree. It is possible that some, if not many, of the instructors were simply accumulating credit hours from attendance at for credit workshops. Two respondents voluntarily reported an M.S. degree and one a Ph.D.

Table 7. Semester hours of graduate courses of agricultural instructors by type of institution, N=119

	Secondary	Post-secondary	Combined
Mean	21.5	24.1	22.4
Median	20.0	30.0	21.0
Range	0/65	0/60	0/65

Of all responding agricultural instructors 10.3% were women, 14.3% of post-secondary instructors were female; while only 8.1% of secondary instructors were female, these figures are shown in Table 8. In a similar study of secondary agriculture instructors conducted in Ohio, 14.5% of respondents were female (McCaslin and Torres, 1992). In a nationwide study which included secondary agriculture instructors from all states, only 6.4% of respondents were female (Dormody, 1993).

The number of secondary female instructors in Iowa and nationwide is very similar. The higher percentage of females at the post-secondary level is most likely accounted for by the number of community colleges with horticulture departments, academic transfer programs and equine studies. Ohio, however has a higher percentage of female instructors at the secondary level and seems to be doing a more effective job of recruiting female agriculture instructors.

Table 8. Gender of agriculture instructors by type of institution, N=119

Gender	Secondary	Post-secondary	Combined
Male			
N	68	36	104
%	91.9	85.7	89.7
Female			
N	6	6	12
%	8.1	14.3	10.3
Total			
N	74	42	116
%	100.0	100.0	100.0

Needs for Additional Training in Technical Skills

The results of conducting a t-test on the responses of secondary and post-secondary instructors on the needs for additional training in technical skills is reported in Table 9. There were significant differences at the .05 level of significance for 12 of the 18 topics under study. Post-secondary instructors are specialists and were only responding to those topics taught by them. It was noted that the N for most topics was around 30, while the number of post-secondary instructors was 45, thus it can be concluded that there were incomplete responses to the topics. As a result of these significant differences, needs for additional training in technical skills are reported separately for secondary and post secondary instructors.

Secondary instructor needs for additional training are reported in Table 10. The top 5 rated topics were as follows: 1) "Ag environmental

Table 9. T-test of need for additional training by post-secondary and secondary instructors

Topic	Post-secondary N	Post-secondary Mean[a] S.D.	Secondary N	Secondary Mean S.D.	t value	t prob.
Agri business	32	2.91 1.15	72	3.33 1.05	-1.86	.065
Agri services	31	2.74 1.15	71	3.23 1.09	-2.03	.045*
Agri supply	31	2.68 1.11	71	3.20 1.06	-2.24	.027*
Crop production	31	2.81 1.08	72	3.10 1.02	-1.30	.196
Animal production	33	2.76 1.17	72	3.14 1.04	-1.68	.097
Ag diversification	29	2.76 1.06	71	3.42 1.14	-2.69	.008**
Ag power machinery	31	2.29 1.07	71	2.83 1.13	-2.25	.026*
Ag construction	30	2.10 1.19	71	2.79 1.05	-2.89	.005**
Ag welding metal and wood	30	1.83 0.91	70	2.66 1.22	-3.94	.000**
Landscape and turfgrass mgmt	30	2.33 1.42	71	3.16 1.22	-2.95	.004**
Nursery and greenhouse	31	2.68 1.51	72	3.57 1.21	-3.18	.002**
Fruit and vegetable production	28	2.29 1.33	70	3.24 1.08	-3.70	.000**

Table 9. Continued

Topic	Post-secondary N	Post-secondary Mean / S.D.	Secondary N	Secondary Mean / S.D.	t value	t prob.
Process agricultural products	29	2.90 / 1.26	71	3.75 / 1.09	-3.37	.001**
Impact global market	31	3.55 / 1.12	70	3.76 / 1.14	-1.86	.394
Government policy	31	3.36 / 1.14	71	3.79 / 0.94	-2.01	.048*
Ag environmental impact	32	3.56 / 1.16	71	3.76 / 0.88	-1.43	.157
Integrated crop management	29	3.48 / 1.24	71	3.37 / 1.02	0.49	.628
Natural resource management	30	3.23 / 1.17	71	3.80 / 0.97	-2.54	.012*

[a]Means were derived based on a scale of 1 (not important) to 5 (extremely important).

*Significant at .05 level.

**Significant at .01 level.

Table 10. Means of secondary instructor needs for additional training, N=74

Topic area	(Rank)	Mean[a]	S.D.
Agri business	(9)	3.33	1.05
Agri services	(11)	3.23	1.09
Agri supply	(12)	3.20	1.06
Crop production	(15)	3.10	1.02
Animal production	(14)	3.14	1.04
Ag diversification	(7)	3.42	1.14
Ag power machinery	(16)	2.83	1.13
Ag construction	(17)	2.79	1.05
Ag welding metal and wood	(18)	2.66	0.98
Landscape and turfgrass mgmt	(13)	3.16	1.22
Nursery and greenhouse	(6)	3.57	1.21
Fruit and vegetable production	(10)	3.24	1.08
Process agricultural products	(5)	3.75	1.09
Impact global market	(4)	3.76	1.14
Government policy	(3)	3.79	0.94
Ag environmental impact	(1)	3.86	0.88
Integrated crop management	(8)	3.37	1.02
Natural resource management	(2)	3.80	0.97

[a]Means were derived based on a scale of 1 (not important) to 5 (extremely important).

impact" with a mean of 3.86; 2) "Natural resource management" with a mean of 3.8; 3) "Government policy" with a mean of 3.79; 4) "Impact of global market" with a mean of 3.76; and 5) "Process agricultural products" with a mean of 3.75. The means of the top five rated topics were within the range of 0.11. Topic choices relate to an increasing awareness on the part of instructors of the need for additional skills and knowledge in the area of the environment and protection of natural resources. This was apparent in this study and in a study conducted in Louisiana where a recommendation was made that natural resource management be included in future inservice programs (Neason, 1992). The next two topics, government policy and impact of the global market reflect the realization of the importance that these areas play in agriculture today. Finally, the processing of agricultural products is becoming an important aspect of industry in Iowa, and instructors are beginning to feel the demand for information. Iowa State University is conducting research in value-added products for both grain and meat, and industry is investing in new plants.

Post-secondary instructor needs for additional training are reported in Table 11. The top 5 rated topics were as follows: 1) "Ag environmental impact" with a mean of 3.56; 2) "Impact of global market" with a mean of 3.55; 3) "Integrated crop management" with a mean of 3.48; 4) "Government policy" with a mean of 3.36; and 5) "Natural resource management" with a mean of 3.23. The means of the top five rated topics were within the range of 0.33. Post-secondary instructors rated four of the top five of secondary instructors as their top five. Post-secondary

Table 11. Means of post-secondary instructor needs for additional training, N=45

Topic area	(Rank)	Mean[a]	S.D.
Agri business	(6)	2.91	1.15
Agri services	(12)	2.74	1.15
Agri supply	(13)	2.68	1.11
Crop production	(9)	2.81	1.08
Animal production	(10)	2.76	1.17
Ag diversification	(10)	2.76	1.06
Ag power machinery	(16)	2.29	1.07
Ag construction	(17)	2.10	1.19
Ag welding metal and wood	(18)	1.83	0.91
Landscape and turfgrass mgmt	(15)	2.33	1.42
Nursery and greenhouse	(13)	2.68	1.51
Fruit and vegetable production	(8)	2.89	1.33
Process agricultural products	(7)	2.90	1.26
Impact global market	(2)	3.55	1.12
Government policy	(4)	3.36	1.14
Ag environmental impact	(1)	3.56	1.16
Integrated crop management	(3)	3.48	1.24
Natural resource management	(5)	3.23	1.17

[a]Means were derived based on a scale of 1 (not important) to 5 (extremely important).

instructors rated integrated crop management higher, replacing processing of agricultural products. The means of the top five topics, however, were lower than secondary instructors. The need of post-secondary instructors for additional training in integrated crop management still reflected the trend towards concern for the impact of agriculture on the environment.

In Table 12, needs for inservice training in the current National Council Professional Growth Series are reported. This series is a part of the "Together We Can" program, a management information gathering network and delivery system for the improvement of agricultural education. This program consists of inservice training and teaching materials (NVATA, 1992). The Iowa Department of Education is conducting inservice training for this series and requested that information be obtained on the needs for inservice programs. "Agricultural issues" was rated most highly, with "food science" and "safety" being second. "Ag sales" was issued in 1992 and was ranked 3rd in need for inservice assistance, possibly reflecting the fact that some instructors had not attended the offered inservice.

To consider current needs for inservice training previous training sessions should be reviewed, as some needs were previously covered. Some aspects of "Ag environmental impact" were covered in the March 24, 1988 Water Quality inservice program; and the October 5 and 6, 1990 inservice on Groundwater Protection. Some aspects of "Natural resource management" were covered in the Natural Resource inservice held July 8, 1988. The March 16, 1991 inservice covered some aspects of "International

Table 12. Needs for inservice training in the following National Council Professional Growth Series, N=119

Need inservice training	Rating Total	Mean Rating	Rank
Agricultural issues	381	3.20	1
Food science and safety	350	2.94	2
Ag sales	330	2.77	3
Maximum economic yield	268	2.25	4
No-till agriculture	233	1.96	5

Agriculture" (Ag Ed S Dept, 1993). In the fall of 1992, an inservice was conducted on corn. This package contained materials on both government policy and value added products.

Needs for New or Additional Curriculum Materials

The results of conducting a t-test on the responses of secondary and post-secondary instructors on the needs for new teaching materials are reported in Table 13. There were significant differences for 11 of the 18 topics under study at the .05 level of significance. Post-secondary instructors are specialists and were possibly only reporting needs for those topics taught by them; it was noted that the N for most topics was around 30, while the number of post-secondary instructors was 45, thus resulting in incomplete responses to the topics. As a result of these

Table 13. T-test of need for new teaching materials by post-secondary and secondary instructors

Topic	Post-secondary N	Mean / S.D.	Secondary N	Mean / S.D.	t value	t prob.
Agri business	36	2.86 / 1.27	73	3.22 / 1.27	-1.38	.169
Agri services	35	2.71 / 1.30	72	3.29 / 1.22	-2.26	.026*
Agri supply	35	2.77 / 1.40	72	3.29 / 1.25	-1.94	.055
Crop production	35	2.91 / 1.38	73	3.43 / 1.19	-2.08	.039*
Animal production	37	2.92 / 1.32	73	3.37 / 1.20	-1.80	.074
Ag diversification	35	2.88 / 1.25	72	3.36 / 1.21	-1.88	.063
Ag power machinery	35	2.47 / 1.21	72	2.88 / 1.21	-1.64	.104
Ag construction	35	2.14 / 1.19	73	3.01 / 1.21	-3.52	.001**
Ag welding metal and wood	35	2.06 / 1.14	73	2.84 / 1.20	-3.21	.002**
Landscape and turfgrass mgmt	35	2.49 / 1.46	72	3.25 / 1.15	-2.95	.004**
Nursery and greenhouse	37	2.70 / 1.54	73	3.62 / 1.21	-3.40	.001**
Fruit and vegetable production	34	2.62 / 1.60	71	3.23 / 1.11	-2.27	.026*
Process agricultural products	35	2.89 / 1.43	72	3.85 / 1.16	-3.72	.000**

Table 13. Continued

Topic	Post-secondary N	Post-secondary Mean / S.D.	Secondary N	Secondary Mean / S.D.	t value	t prob.
Impact global market	36	3.44 / 1.42	71	3.89 / 1.10	-1.78	.079
Government policy	36	3.36 / 1.33	72	3.83 / 1.02	-2.04	.044*
Ag environmental impact	37	3.27 / 1.37	72	3.89 / 0.90	-2.49	.016*
Integrated crop management	35	3.06 / 1.51	70	3.24 / 1.17	-0.69	.490
Natural resource management	35	3.03 / 1.42	72	3.82 / 1.14	-3.09	.003**

[a]Means were derived based on a scale of 1 (not important) to 5 (extremely important).

*Significant at .05 level.

**Significant at .01 level.

significant differences, needs for new teaching materials are reported separately for secondary and post-secondary instructors.

Secondary instructor needs for new teaching materials are reported in Table 14. The top five rated topics where teaching materials were needed were as follows: 1) "Agricultural environmental impact", and the "Impact of the global market" both with a mean of 3.89; 3) "Process

Table 14. Secondary instructor needs for new teaching materials, N=74

Topic area	(Rank)	Mean	S.D.
Agri business	(15)	3.22	1.27
Agri services	(10)	3.29	1.22
Agri supply	(10)	3.29	1.25
Crop production	(7)	3.45	1.19
Animal production	(8)	3.37	1.20
Ag diversification	(9)	3.36	1.21
Ag power machinery	(17)	2.88	1.21
Ag construction	(16)	3.01	1.21
Ag welding metal and wood	(18)	2.84	1.20
Landscape and turfgrass mgmt	(12)	3.25	1.15
Nursery and greenhouse	(6)	3.62	1.21
Fruit and vegetable production	(14)	3.23	1.11
Process agricultural products	(3)	3.85	1.16
Impact global market	(1)	3.89	1.10
Government policy	(4)	3.84	1.02
Ag environmental impact	(1)	3.89	0.90
Integrated crop management	(13)	3.24	1.17
Natural resource management	(5)	3.82	1.14

[a]Means were derived based on a scale of 1 (not important) to 5 (extremely important).

agricultural products" with a mean of 3.85; 4) "Government policy" with a mean of 3.84; and 5) "Natural resource management" with a mean of 3.82. The means of the top five rated topics were within the range of 0.07 indicating that they were rated very similarly. In a study conducted by Bekkum and Hoerner (1992), subject matter areas identified for future development of teaching materials included 1) conservation and erosion control, 2) horticulture and floriculture, 3) biotechnology and 4) agricultural business, sales and marketing, similar topics to those identified in this study.

Secondary instructors rated the same topics in the top five for inservice needs and needs for new teaching materials. This on the one hand provides reinforcement in the selection of instructor needs, and secondly, should assist in the development of inservice programs and materials. It will allow university curricula specialists to coordinate their activities with inservice training specialists.

Post-secondary instructor needs for new teaching materials are reported in Table 15. The top 5 rated topics where teaching materials were needed are as follows: 1) "Impact of global markets" with a mean of 3.44; 2) "Government policy" with a mean of 3.36; 3) "Ag environmental impact" with a mean of 3.27; 4) "Integrated crop management" with a mean of 3.06; and 5) "Natural resource management" with a mean of 3.03. The means of the top five rated topics were within the range of 0.31.

Post-secondary instructors rated the same topics in the top five for inservice needs and needs for new teaching materials. As with secondary instructors, these results provide reinforcement in the selection of

Table 15. Post-secondary instructor needs for new teaching materials, N=45

Topic area	(Rank)	Mean[a]	S.D.
Agri business	(10)	2.86	1.27
Agri services	(12)	2.71	1.30
Agri supply	(11)	2.77	1.10
Crop production	(7)	2.91	1.38
Animal production	(6)	2.92	1.32
Ag diversification	(9)	2.88	1.25
Ag power machinery	(16)	2.47	1.21
Ag construction	(17)	2.14	1.19
Ag welding metal and wood	(18)	2.06	1.14
Landscape and turfgrass mgmt	(15)	2.49	1.46
Nursery and greenhouse	(13)	2.70	1.54
Fruit and vegetable production	(14)	2.62	1.60
Process agricultural products	(8)	2.89	1.43
Impact global market	(1)	3.44	1.42
Government policy	(2)	3.36	1.33
Ag environmental impact	(3)	3.27	1.37
Integrated crop management	(4)	3.06	1.51
Natural resource management	(5)	3.03	1.42

[a]Means were derived based on a scale of 1 (not important) to 5 (extremely important).

instructor needs and assist in the development of inservice programs and materials. Again, this will allow university curricula specialists to coordinate their activities with inservice training specialists.

Types of Curricular Materials Most Needed

Secondary instructor needs for new teaching materials are reported in Table 16. These data are reported in the form of frequencies and percentage. Most frequently requested materials were activities and videotapes. Activities or videotapes were requested by at least 47% of respondents for all topics. Lesson plans and background information were somewhat less in demand, while slide materials were wanted by 20% or less. In a study of Iowa instructors which evaluated instructional materials packages distributed over a number of years, it was reported that the videotapes had been the most useful and most needed items among the instructional materials, ranking first with a mean of 4.81 on a 5.0 scale (Bekkum and Hoerner, 1992).

Teaching material needs for the top five topics were as follows: well over 50% of instructors required activities and videotapes, over 40% requested lesson plans, and at least 38% needed background information. The three greatest needs were for 1) videotapes on "processing agricultural products" requested by 66.2% of respondents, 2) activities for "impact of the global market" requested by 62.0% of respondents, and 3) videotapes on "natural resource management" needed by 60.6% of responding instructors.

Table 16. Secondary instructor needs for new curricular materials, N=74

Topic	Lesson plans Frequency/%	Activities Frequency/%	Background Info Frequency/%	Slides Frequency/%	Video Frequency/%
Agri business	25/35.2	40/56.3	19/26.4	8/11.1	42/58.3
Agri services	30/41.7	35/48.6	20/27.8	6/8.3	38/52.8
Agri supply	33/45.8	39/54.2	23/31.9	6/8.3	36/50.0
Crop production	26/36.1	38/52.8	20/27.8	8/11.1	41/56.9
Animal production	24/33.3	35/48.6	19/26.4	11/15.3	39/54.2
Ag diversification	29/40.3	32/44.4	26/36.1	12/16.7	36/50.0
Ag power machinery	25/34.7	26/36.1	17/23.6	7/9.7	36/50.0
Ag construction	25/34.7	35/48.6	16/22.2	4/5.6	37/51.4
Ag welding metal and wood	23/31.9	32/44.4	20/27.8	4/5.6	29/40.3
Landscape and turfgrass mgmt	24/32.4	31/41.9	23/32.4	13/18.3	38/53.5
Nursery and greenhouse	28/39.4	35/49.3	23/32.4	14/19.7	39/54.9
Fruit and vegetable production	26/36.6	27/38.0	23/32.4	13/18.3	36/50.7
Process agricultural products	30/42.3	38/53.5	31/43.7	13/18.3	47/66.2
Impact global market	33/46.5	44/62.0	32/45.1	10/14.1	37/52.1
Government policy	30/42.3	40/56.3	31/43.7	9/12.7	36/50.7
Ag environmental impact	31/43.7	39/54.9	33/46.5	12/16.9	42/59.2
Integrated crop management	26/36.6	36/50.7	25/35.2	8/11.3	32/45.1
Natural resource management	29/40.8	38/53.5	27/38.0	14/19.7	43/60.6

Reasons for Non-Participation at Inservice Programs

Instructor attendance, both secondary and post-secondary, of inservice meetings are reported in Table 17. Respondents were asked to report their attendance by quartile at inservice meetings over the past three years. Almost 60% of instructors felt that they had attended at least 75% of inservices and three-quarters had attended at least 50%. At a recent summer conference inservice program conducted by Iowa State University 49% of Iowa agriculture secondary instructors attended (AgEdS, 1993).

Table 17. Instructor attendance at inservice education meetings last three years, N=119

Attendance	Frequency	Valid percent
100%	11	9.4
75%	56	47.9
50%	23	19.7
25%	17	14.5
Never attended	10	8.5
No response	2	missing

The reasons given by instructors for non-attendance at inservices are presented in Table 18. Respondents were asked to mark their first three choices 1,2,3. Responses were then recoded 3,2,1 and zero. These responses were then totalled giving a rating total with a calculated mean rating. Nine items were ranked; the top four reasons for not attending were 1) times not convenient, 2) cannot take time from other duties, 3) too far to travel, and 4) inservice topic not relevant. The mean ratings ranged from 1.46 to 0.90. The final five reasons for not attending were all rated considerably lower, in the range of 0.19 to 0.13. The top four reasons given for non-attendance were all areas over which inservice planners and administrators have control. Surprisingly reasons for non-attendance that would have been considered of greater importance to instructors were actually rated very low.

Table 18. Instructor reasons for non-attendance at inservices, N=119

Reasons	Rating Total	Mean Rating	Rank
Times are not convenient	174	1.46	1
I cannot take time from other duties	122	1.03	2
Too far to travel	112	0.94	3
Inservice topic not relevant	107	0.90	4
Teach part-time and cannot take off from other employment	23	0.19	5
School will not pay expenses	21	0.18	6
School will not allow paid time off	20	0.17	7
I feel that I keep current myself	19	0.16	8
Inservices not well presented	15	0.13	9

Instructor Preferences in Selection of Format, Time Schedules, and Location of Future Inservice Programs

Data in this section was obtained by asking respondents to mark their first three choices 1,2,3. Responses were then recoded 3,2,1 and zero. These responses were then totalled giving a rating total with a calculated mean rating.

Preferred inservice delivery methods for instructors are presented in Table 19. Instructors showed a clear preference for credit workshops and videotapes while community college offerings were ranked third. Fiber optic network, satellite TV, and computer network programs were rated low, with mean ratings below 0.58. In a similar, nation-wide study of agriculture instructors, it was found that a lack of interest hindered the adoption of computer networks. It was suggested that teacher educators should assist present and future teachers to develop the skills and abilities to utilize computer networks (Birkenholz and Stewart, 1991).

Table 19. Instructor preference for inservice delivery methods, N=119

Methods	Rating Total	Mean Rating	Rank
Credit workshop	209	1.76	1
Videotapes	208	1.75	2
Community college offerings	161	1.35	3
Fiber optic network	69	0.58	4
Satellite TV	40	0.34	5
Computer network	10	0.08	6

In a 1987 study it was found that Master Gardeners were satisfied with the delivery of portions of their program by satellite telecast. Almost 90% indicated they would be willing to attend satellite telecasts in the future (Eckles, 1987). Plans were already underway to use some of the newer techniques of information transfer in inservice training, particularly as Iowa completes the fiber optic network and as many schools prepare to link-up with that network. As a result of the low rating for these new techniques steps will need to be taken to educate instructors on the advantages of these techniques.

Data reported in Table 20 show a clear preference for summer delivery times. Weekday workshops during summer and the summer conference ranked at the top with ratings of 152 and 148. Saturday meetings during the school year or in summer were not popular. The Southridge Mall March inservice was at the bottom with a total rating of only 17, most probably due to scheduling on Saturday, and the distance to Southridge Mall for most instructors. Preferred delivery times in this study were very similar to the Neason (1992) study in Louisiana. In that study, the summer leadership camp and weekday summer meetings were the overwhelming choices. Of further interest was the low preference for Saturday in both studies. Summer or school year Saturday meetings were in 6th and 7th place in the Neason study, compared with this study in which these choices shared 7th place.

Table 20. Instructor preference for inservice delivery times

Times	Rating Total	Mean Rating	Rank
Weekday workshop one or more days during summer	152	1.28	1
During summer conference	148	1.24	2
2-3 hour night meeting during school year	99	0.83	3
Programs at ISU campus during summer	97	0.82	4
Weekday workshop one or more days during school year	79	0.66	5
2-3 hour night meeting during summer	40	0.34	6
Half or whole day Saturday during school year	35	0.29	7
Half or whole day Saturday during summer	35	0.29	7
Southridge Mall in March	17	0.14	9

Differences Between Instructor Needs and Selected Demographic Variables

Oneway Anovas of different selected demographic variables

A series of oneway anovas were conducted on secondary instructor needs using selected demographic variables. The Scheffé test, a conservative test, was used to find the location of the significant differences f series (-.05). No significant differences were found when compared

with the district where the respondents' school was located. In other oneway anova tests, at least one topic was found to exhibit a significant difference from other variables. In the Louisiana study, selected teacher (instructor) characteristics were compared with teacher's mean topic scores to determine if relationships existed among these variables. It was determined there were no relationships between teacher demographic characteristics and their topic scale scores (Neason, 1992).

When comparing the need for additional training with years taught a significant difference was found in the needs for additional training in integrated crop management. These findings can be found in Table 21. The significant difference occurred between instructors with 11 to 15 years teaching experience who rated it with a mean of 2.82, or important, and those with over 26 years experience who rated it with a mean of 5.00, or extremely important. Contrary to these findings, in the Louisiana study, Neason (1992) reported no relationship with the teacher's perceived level of knowledge and skills and the length of time a teacher has taught.

The oneway anova of new teaching materials with years taught also found a significant difference at the .05 level. The Sheffé test identified that this occurred with integrated crop management and instructors with 11 to 15 years teaching who rated it with a mean of 2.47, or somewhat important, and those with over 26 years experience who rated it with a mean of 4.75, or extremely important. These data are reported in Table 22.

Table 21. One-way anova, need for additional training with years taught. Secondary instructors, N=72

Topic		Years Taught 1-5	6-10	11-15	16-20	21-25	Over 26	Overall mean	F ratio	F prob.
Agri business	Mean	3.12	3.13	3.59	3.17	3.71	3.75	3.33	0.816	0.542
	S.D.	1.31	0.92	1.12	0.83	0.95	0.50	1.05		
Agri services		3.19	3.07	3.47	2.83	3.14	4.25	3.23	1.305	0.270
		1.33	0.96	1.01	0.94	1.07	0.96	1.08		
Agri supply		3.06	2.87	3.47	2.92	3.29	4.50	3.20	2.092	0.077
		1.24	0.92	1.07	0.90	0.76	1.00	1.06		
Crop production		2.71	2.73	3.18	3.50	3.29	4.25	3.10	2.594	0.033
		1.21	0.70	1.13	0.80	0.76	0.50	1.02		
Animal production		3.06	3.13	3.00	3.17	3.14	4.00	3.14	0.615	0.688
		1.14	0.92	1.17	1.11	0.90	0.00	1.04		
Ag diversification		3.38	3.40	3.35	3.25	3.57	4.25	3.42	0.499	0.776
		1.50	1.12	1.11	1.14	0.53	0.50	1.14		
Ag power machinery		2.69	3.13	2.53	2.67	2.71	4.25	2.83	1.947	0.099
		1.20	1.13	1.07	1.23	0.76	0.50	1.13		
Ag construction		2.69	2.53	2.94	2.75	2.71	3.75	2.79	0.948	0.456
		1.08	0.92	1.20	1.14	0.76	0.96	1.06		
Ag welding metal and wood		2.50	2.60	2.38	3.00	2.71	3.50	2.66	1.283	0.282
		1.21	0.74	1.09	0.95	0.49	0.58	0.98		

Landscape and turfgrass mgmt	3.63 1.36	2.88 1.21	2.82 1.27	3.25 1.14	3.00 0.82	3.75 0.96	3.16 1.21	1.148	0.345
Nursery and greenhouse	4.06 1.09	3.27 1.23	3.18 1.33	3.68 1.15	3.29 1.11	4.50 0.58	3.57 1.21	1.763	0.133
Fruit and vegetable production	3.31 1.01	2.87 1.19	3.25 1.18	3.50 1.00	3.00 0.82	4.00 1.15	3.24 1.08	0.971	0.443
Process agricultural products	3.69 1.08	3.67 1.23	4.00 1.27	3.50 1.00	3.57 0.79	4.25 0.50	3.75 1.09	0.519	0.761
Impact global market	3.50 1.26	3.53 1.64	4.13 0.62	3.67 0.89	3.90 1.07	4.25 0.50	3.76 1.13	0.782	0.567
Government policy	3.63 1.15	4.00 1.07	3.82 0.88	3.50 0.67	3.71 0.76	4.50 0.58	3.79 0.94	0.943	0.459
Ag environmental impact	3.88 0.89	4.00 0.93	3.71 0.77	3.42 1.00	4.14 0.69	4.75 0.50	3.86 0.88	1.846	0.116
Integrated crop management	3.29 0.99	3.50 1.09	2.82[a] 0.81	3.42 0.90	3.57 0.98	5.00[b] 0.00	3.37 1.02	3.786	0.005**
Natural resource management	3.75 0.77	3.80 1.15	3.65 1.06	3.83 0.83	3.57 0.98	5.00 0.00	3.80 1.00	1.457	0.216

*Significant at the .05 level.

**Significant at the .01 level.

Scheffé: a < b.

Table 22. One-way anova, need for new teaching materials with years taught. Secondary instructors, N=72

Topic		Years Taught 1-5	6-10	11-15	16-20	21-25	Over 26	Overall mean	F ratio	F prob.
Agri business	Mean	3.31	2.80	3.22	3.25	3.57	3.25	3.19	0.435	0.823
	S.D.	1.35	1.21	1.40	1.22	0.98	1.50	1.26		
Agri services		3.47	2.87	3.50	2.92	3.29	4.25	3.28	1.272	0.287
		1.19	1.19	1.38	1.16	0.95	0.96	1.22		
Agri supply		3.40	2.93	3.44	2.92	3.29	4.50	3.28	1.301	0.274
		1.12	1.33	1.46	1.16	0.76	1.00	1.26		
Crop production		3.56	3.20	3.22	3.75	3.15	4.25	3.43	0.898	0.488
		1.46	1.08	1.26	1.06	0.90	0.50	1.18		
Animal production		3.56	3.20	3.06	3.58	3.14	4.00	3.35	0.731	0.603
		1.21	1.26	1.35	1.16	0.90	0.00	0.19		
Ag diversification		3.33	3.27	3.22	3.25	3.57	4.25	3.35	0.533	0.750
		1.35	1.39	1.35	1.14	0.53	0.50	1.22		
Ag power machinery		2.56	3.33	2.39	3.08	2.57	4.25	2.86	2.685	0.029*
		1.41	0.82	1.24	1.31	0.53	0.50	1.21		
Ag construction		2.94	2.93	2.83	3.25	2.86	3.75	3.00	0.497	0.778
		1.34	1.10	1.42	1.22	0.69	0.96	1.21		
Ag welding metal and wood		2.75	2.93	2.39	3.17	2.71	3.75	2.82	1.206	0.316
		1.57	1.03	1.33	0.83	0.49	0.96	1.20		

Landscape and turfgrass mgmt	4.07 0.96	3.13 1.06	2.78 1.35	3.08 1.00	3.00 0.87	3.75 0.96	3.25 1.16	2.685	0.029
Nursery and greenhouse	4.19 1.11	3.60 1.12	3.28 1.56	3.50 0.90	3.29 1.11	4.00 0.82	3.63 1.22	1.209	0.315
Fruit and vegetable production	3.73 1.10	2.87 1.06	2.88 1.27	3.33 0.89	3.00 0.82	4.25 0.96	3.23 1.12	2.166	0.069
Process agricultural products	3.80 1.15	4.00 1.31	3.94 1.47	3.42 0.79	3.71 0.76	4.50 0.58	3.85 1.17	0.660	0.655
Impact global market	3.60 1.24	3.60 1.55	4.12 0.86	4.00 0.74	4.00 1.00	4.25 0.50	3.87 1.10	0.663	0.653
Government policy	3.80 1.15	4.13 1.19	3.83 0.92	3.33 0.98	3.71 0.76	4.50 0.58	3.83 1.03	1.198	0.320
Ag environmental impact	4.13 0.74	3.87 1.06	3.61 0.98	3.58 0.79	4.14 0.69	4.50 0.58	3.87 0.89	1.374	0.246
Integrated crop management	3.44 1.21	3.54 0.88	2.47[a] 1.23	3.00 0.95	3.57 0.98	4.75[b] 0.50	3.23 1.18	3.931	0.004**
Natural resource management	3.93 0.80	3.87 1.25	3.50 1.47	3.75 0.97	3.57 0.98	5.00 0.00	3.80 1.14	1.268	0.289

*Significant at the .05 level.

**Significant at the .01 level.

Scheffé: a < b.

A comparison of needs for additional training with type of instructor contract is shown in Table 23. According to the Sheffé test, a significant difference at the .05 level with a need for training in government policy occurred between instructors with a part-time contract who rated it with a mean of 2.60, or important, and instructors with a full time 12 month contract who rated it with a mean of 4.04, or very important.

A comparison of needs for teaching materials with type of teaching contract is shown in Table 24. Significant differences were found with agricultural power machinery and all instructor contracts. According to the Sheffé test, full time 9 month contract instructors rated it with a mean of 4.83, or extremely important, while all other contract levels rated it somewhat important, or important. Similar results were found with agricultural construction and all contract types with the exception of full time 11 month instructors. Again full time 9 month instructors rated it extremely important, while the other instructor contract levels rated it somewhat important, or important. Lastly, part-time instructors, with a mean of 2.00, or somewhat important, full time 9 month instructors with a mean of 4.33, or very important, and full time 12 month instructors with a mean of 2.48, or important, showed a significant difference when compared with needs for agriculture welding, metal and wood.

There were no significant differences when needs for additional training were compared to size of school district; these data are shown in Table 25.

Table 23. One-way anova, need for additional training with type of contract. Secondary instructors, N=72

Topic		Less than full time	Full time 9 months	Full time 10 months	Full time 11 months	Full time 12 months	Overall mean	F ratio	F prob.
Agri business	Mean	3.20	3.33	3.08	3.63	3.20	3.33	0.746	0.564
	S.D.	1.65	1.37	1.16	0.88	0.96	1.05		
Agri services		2.80	3.20	2.67	3.50	3.32	3.23	1.458	0.225
		1.48	1.30	1.23	0.88	1.03	1.08		
Agri supply		3.00	3.60	2.67	3.21	3.40	3.20	1.210	0.315
		1.22	1.34	1.23	0.88	1.04	1.06		
Crop production		2.80	4.17	3.50	2.83	2.96	3.10	3.033	0.023
		1.79	0.98	1.17	0.82	0.79	1.02		
Animal production		3.20	3.83	3.50	3.04	2.88	3.14	1.522	0.206
		1.48	1.47	1.24	0.91	0.78	1.04		
Ag diversification		3.60	4.60	2.92	3.33	3.48	3.42	2.128	0.087
		1.52	0.89	1.31	1.13	0.92	1.14		
Ag power machinery		2.20	4.20	2.42	2.83	2.88	2.83	2.908	0.028*
		0.84	1.30	1.31	1.05	0.97	1.13		
Ag construction		2.20	4.00	2.33	2.92	2.76	2.79	2.999	0.025*
		0.84	1.22	1.30	0.88	0.93	1.05		
Ag welding metal and wood		2.40	3.80	2.67	2.57	2.56	2.66	2.027	0.101
		0.89	1.10	1.23	0.90	0.82	0.98		

Landscape and turfgrass mgmt	3.60 1.52	4.00 1.22	2.83 1.70	2.92 1.14	3.28 0.89	3.16 1.22	1.302	0.278
Nursery and greenhouse	3.40 1.52	4.17 1.33	3.25 1.60	3.50 1.14	3.68 0.99	3.57 1.21	0.660	0.622
Fruit and vegetable production	3.60 1.34	3.20 1.30	2.91 1.22	3.08 1.06	3.48 0.96	3.24 1.08	0.821	0.517
Process agricultural products	2.80 1.10	3.60 1.14	3.92 1.38	3.92 0.83	3.72 1.14	3.75 1.09	1.198	0.320
Impact global market	2.80 1.30	4.25 0.96	3.25 1.14	3.88 1.26	4.00 0.87	3.76 1.13	2.165	0.083
Government policy	2.60[a] 1.14	3.80 0.84	3.67 0.98	3.83 0.96	4.04[b] 0.73	3.79 0.94	2.764	0.035*
Ag environmental impact	3.80 1.30	3.20 0.84	3.75 0.87	3.92 0.88	4.00 0.82	3.86 0.88	0.929	0.453
Integrated crop management	3.00 1.22	4.00 0.89	3.08 1.16	3.39 0.84	3.40 1.08	3.37 1.02	0.985	0.422
Natural resource management	3.60 1.14	4.20 0.84	3.50 1.17	3.83 0.82	3.88 1.01	3.80 0.97	0.594	0.668

*Significant at the .05 level.

Scheffé: a < b.

Table 24. One-way anova of needs for new teaching materials with type of contract. Secondary instructors, N=72

Topic		Less than full time	Full time 9 months	Full time 10 months	Full time 11 months	Full time 12 months	Overall mean	F ratio	F prob.
Agri business	Mean	3.00	3.17	2.83	3.52	3.16	3.22	0.666	0.618
	S.D.	1.58	1.72	1.19	1.29	1.14	1.27		
Agri services		3.00	3.60	2.50	3.44	3.52	3.29	1.819	0.135
		1.41	1.14	1.31	1.08	1.19	1.22		
Agri supply		3.00	3.80	2.50	3.36	3.56	3.29	1.874	0.125
		1.27	1.30	1.31	1.11	1.26	1.25		
Crop production		2.80	4.50	3.58	3.60	3.12	3.45	2.313	0.066
		1.48	0.84	1.31	1.32	0.83	1.19		
Animal production		3.20	4.33	3.50	3.48	3.00	3.37	1.755	0.148
		1.48	0.82	1.45	1.19	1.00	1.20		
Ag diversification		3.40	4.00	2.58	3.48	3.48	3.36	1.773	0.145
		1.34	1.41	1.17	1.26	1.05	1.21		
Ag power machinery		2.00[a]	4.83[b]	2.25[c]	3.04[d]	2.72[e]	2.88	7.631	0.000**
		1.00	0.41	0.97	1.06	1.14	1.21		
Ag construction		2.00[f]	4.67[g]	2.92[h]	3.12	2.76[i]	3.01	4.912	0.002**
		1.00	0.52	1.31	1.01	1.16	1.21		
Ag welding metal and wood		2.00[j]	4.33[k]	2.83	3.00	2.48[l]	2.84	4.245	0.004**
		1.00	0.82	1.11	1.19	1.08	1.20		

Landscape and turfgrass mgmt	3.40 1.52	4.000 1.0000	3.000 1.4142	3.16 0.90	3.28 1.21	3.25 1.15	0.729	0.575
Nursery and greenhouse	3.40 1.52	4.17 1.33	3.58 1.38	3.56 1.12	3.60 1.90	3.62 1.21	0.355	0.840
Fruit and vegetable production	3.60 1.34	3.80 1.30	2.91 1.14	3.08 1.00	3.32 1.14	3.23 1.11	0.844	0.502
Process agricultural products	3.00 1.41	3.80 1.30	4.08 1.08	3.88 0.97	3.88 1.30	3.85 1.16	0.796	0.532
Impact global market	3.00 1.58	4.00 1.00	3.67 0.89	3.88 1.33	4.08 0.76	3.89 1.10	1.468	0.222
Government policy	2.80 1.48	3.60 1.14	3.75 0.87	3.88 1.01	4.08 0.91	3.83 1.02	1.825	0.134
Ag environmental impact	4.00 1.00	3.60 0.89	3.42 1.00	3.96 0.89	4.08 0.81	3.89 0.90	1.328	0.269
Integrated crop management	3.00 1.22	3.83 1.33	2.75 1.14	3.50 0.91	3.16 1.31	3.24 1.17	1.280	0.287
Natural resource management	3.40 1.14	4.60 0.89	3.42 1.24	3.84 0.99	3.92 1.26	3.82 1.14	1.188	0.324

*Significant at the .05 level.

**Significant at the .01 level.

Scheffé: b > a, c, d, e,
g > f, h, i,
k > j, l,

Table 25. One-way anova of needs for additional training with size of school district. Secondary instructors, N=72

Topic		Greater than 1500	1000-1499	750-999	500-749	Under 500	Overall mean	F ratio	F prob.
Agri business	Mean	3.17	3.46	3.15	3.20	3.83	3.33	1.022	0.402
	S.D.	1.19	1.20	0.88	1.15	0.83	1.05		
Agri services		2.67	3.32	3.35	3.43	3.33	3.23	1.015	0.406
		1.23	1.09	0.99	1.22	0.89	1.09		
Agri supply		2.67	3.23	3.20	3.21	3.67	3.20	1.362	0.257
		1.23	1.01	0.95	1.19	0.89	1.06		
Crop production		2.67	3.00	3.00	3.27	3.58	3.10	1.419	0.237
		1.44	0.91	1.03	0.59	1.00	1.02		
Animal production		2.83	3.15	2.90	3.20	3.75	3.16	1.632	0.176
		1.27	0.80	1.12	1.01	0.75	1.04		
Ag diversification		2.83	3.39	3.40	3.50	4.00	3.42	1.645	0.173
		1.27	0.77	1.39	1.09	0.74	1.14		
Ag power machinery		2.50	2.62	2.65	3.14	3.33	2.83	1.384	0.249
		1.38	1.04	1.09	1.10	0.98	1.13		
Ag construction		2.17	3.00	2.65	2.93	3.25	2.79	2.006	0.104
		1.11	1.08	0.93	1.07	0.97	1.05		
Ag welding metal and wood		2.33	2.58	2.45	2.79	3.25	2.66	1.822	0.135
		1.15	1.08	0.83	0.98	0.75	0.98		

Landscape and turfgrass mgmt	3.33 1.50	2.58 1.04	2.45 1.26	2.79 1.12	3.25 1.11	2.66 1.21	1.822	0.135
Nursery and greenhouse	3.67 1.44	3.54 1.27	3.35 1.18	3.93 1.16	3.42 1.08	3.57 1.21	0.560	0.692
Fruit and vegetable production	3.82 1.08	3.15 0.90	2.95 1.10	3.57 1.28	2.92 0.79	3.24 1.08	1.846	0.131
Process agricultural products	3.33 1.37	4.15 1.07	3.70 1.26	3.86 0.77	3.67 0.78	3.75 1.09	0.940	0.447
Impact global market	3.58 1.24	4.08 0.90	3.80 1.28	3.43 1.22	3.92 0.90	3.76 1.13	0.665	0.619
Government policy	3.67 1.23	3.92 0.86	3.75 0.85	3.93 1.00	3.67 0.89	3.79 0.94	0.243	0.913
Ag environmental impact	4.50 0.67	3.77 0.83	3.65 0.88	3.86 0.95	3.67 0.89	3.86 0.88	2.173	0.082
Integrated crop management	2.82 1.25	3.39 0.87	3.35 1.09	3.53 1.06	3.67 0.65	3.37 1.02	1.174	0.330
Natural resource management	4.00 0.85	3.69 1.03	3.65 0.93	3.93 1.21	3.83 0.83	3.80 0.97	0.342	0.886

Table 26 reports the needs for new teaching materials compared with the size of school district. There were significant differences at the .05 level between the need for materials on agricultural construction topics and school size. Significant variables were found between schools with enrollment greater than 1,500, with a mean of 1.92, or somewhat important, schools with an enrollment of 500 to 749 with a mean of 3.63, or very important, and schools under 500 students with a mean of 3.42, or important.

Correlation of instructor responses with selected demographics

A series of Spearman Rho correlations compared instructor reasons for not attending inservice meetings, most convenient inservice delivery times, and inservice delivery methods with the variables length of contract, Iowa district location, and size of school. While there were some significant differences, none of the correlation coefficients were greater than 0.30, with the exception of instructors with less than full time contracts who reported being unable to take time off from other employment. Neason (1992) also found no correlation between teacher demographic characteristics and selected variables. According to Hinkle, Wiersma, and Jurs (1979) correlation coefficients below 0.30 indicate very little, if any correlation.

Interesting trends were present in some of the variables showing significant differences; however, none of the correlations were greater than 0.30. Full time 9 month instructors felt they kept current themselves, while full time 10 month instructors felt inservice topics

Table 26. One-way Anova, need for new teaching materials with size of school district. Secondary instructors, N=72

Topic		Greater than 1500	1000-1499	750-999	500-749	Under 500	Overall mean	F ratio	F prob.
Agri business	Mean	3.08	3.31	3.05	2.94	2.92	3.22	1.254	0.297
	S.D.	1.31	1.32	1.23	1.34	1.08	1.27		
Agri services		2.75	3.23	3.40	3.33	3.67	3.29	0.930	0.452
		1.42	1.36	1.14	1.35	0.65	1.22		
Agri supply		2.83	3.23	3.40	3.07	3.92	3.29	1.347	0.262
		1.53	1.36	1.14	1.28	0.79	1.25		
Crop production		3.16	3.15	3.60	3.56	3.67	3.45	0.571	0.684
		1.59	0.99	1.16	1.21	1.07	1.19		
Animal production		3.17	3.15	3.30	3.44	3.83	3.37	0.660	0.622
		1.59	0.69	1.26	1.36	0.83	1.20		
Ag diversification		2.92	3.46	3.25	3.40	3.83	3.36	0.920	0.458
		1.44	0.78	1.48	1.24	0.72	1.21		
Ag power machinery		2.42	2.39	2.80	3.38	3.33	2.88	2.230	0.075
		1.44	1.19	1.06	1.20	0.98	1.21		
Ag construction		1.92[a]	3.00	2.95	3.63[b]	3.42[c]	3.01	4.625	0.002**
		1.16	1.15	1.05	1.15	1.00	1.21		
Ag welding metal and wood		2.17	2.62	2.65	3.31	3.42	2.84	2.727	0.036*
		1.27	1.19	1.04	1.30	0.90	1.20		

Landscape and turfgrass mgmt	3.58 1.62	3.54 0.97	3.15 1.14	2.73 0.96	3.42 0.90	3.25 1.14	1.346	0.262
Nursery and greenhouse	3.92 1.38	3.39 1.12	3.25 1.21	3.94 1.24	3.75 1.06	3.62 1.21	1.088	0.370
Fruit and vegetable production	3.67 1.37	3.00 0.71	2.95 1.15	3.36 1.34	3.33 0.78	3.23 1.11	0.991	0.419
Process agricultural products	3.42 1.68	3.92 0.95	3.85 1.35	4.00 0.76	4.00 0.85	3.85 1.16	0.531	0.713
Impact global market	3.58 1.44	4.11 0.94	3.90 1.21	3.60 0.99	4.25 0.75	3.89 1.10	1.001	0.414
Government policy	3.67 1.23	3.85 0.99	3.90 0.97	3.93 1.16	3.75 0.87	3.83 1.02	0.150	0.962
Ag environmental impact	4.33 0.78	3.92 0.86	3.55 0.69	3.73 1.22	4.17 0.72	3.89 0.97	1.956	0.111
Integrated crop management	2.91 1.38	3.08 1.24	3.16 1.21	3.25 1.18	3.83 0.72	3.24 1.17	1.068	0.380
Natural resource management	4.00 0.95	3.54 1.27	3.70 1.22	3.93 1.28	4.00 0.95	3.82 1.14		

*Significant at the .05 level.

**Significant at the .05 level.

Scheffé: b > a, c,

were not relevant. Full time 11 month instructors also felt they kept current themselves and that inservice times were not convenient. Instructors with 12 month contracts reported that their schools would not allow paid time off and also that they could not take time away from other duties. These data were presented in Table 27.

Table 27. Spearman rho correlation of inservice delivery methods with size of school district, N=118

	Post-secondary	More than 1,500	1,000 1,499	750 999	500 749	Under 500
Videotapes						
Correlation	-.1308	.0386	.0012	-.0366	-.0045	.2123
Significance	.079	.339	.495	.347	.481	.010*
Fiber optic network						
Correlation	.2202	.1083	-.1226	-.0290	-.1716	-.0997
Significance	.008**	.121	.093	.378	.032*	.141
Satellite TV						
Correlation	.2089	-.1223	-.0612	-.1482	.0347	-.0038
Significance	.012*	.094	.255	.055	.355	.484
Computer network						
Correlation	.0320	.0312	-.0883	-.1634	.0089	.1349
Significance	.365	.369	.171	.111	.462	.073
Credit workshop						
Correlation	-.2789	.0796	.1417	.1886	.0319	-.0486
Significance	.001**	.196	.063	.020*	.366	.301
Community college offerings						
Correlation	.1959	-.1958	.0395	-.0247	-.0252	-.0959
Significance	.017*	.017*	.335	.395	.393	.151

*Significant at the .05 level.

**Significant at the .01 level.

Instructors from the SE district showed a significant difference in their preference for night meetings during the school year. There were significant differences between instructors from the NE and SW related to programs at Iowa State campus during the summer with the NE showing preferences for the Iowa State campus and instructors in the SW not preferring programs at Iowa State. March programs at Southridge Mall showed significant differences, with instructors from the SC district preferring this location while the NC district did not. Again none of these significant differences had correlations over 0.30. These data are presented in Table 28.

Post-secondary instructors were significantly different in their preferences for fiber optic network, satellite TV, credit workshops and community college offerings. These findings would be expected from post-secondary instructors as they would be the first to utilize the fiber optic network. The other options would all be available in their community college. These data are shown in Table 29. There was a similar preference for community college offerings by instructors from schools with enrollments over 1,500, and instructors from schools with enrollments of 750 to 999 were also significantly different in their preferences for the fiber optic network. These preferences most likely occur due to location of larger schools nearer metropolitan areas with community colleges. Instructors from schools under 500 showed a preference for videotapes, most probably due to their rural location and greater use of videotapes.

Table 28. Spearman rho correlation of most convenient inservice delivery times with location of school, N=112

	NE	NC	NW	SE	SC	SW
2-3 hour night meeting during school year						
Correlation	-.0231	-.0336	-.1334	.1938	-.0423	.0805
Significance	.404	.363	.080	.020*	.329	.199
2-3 hour night meeting during summer						
Correlation	.0099	-.1009	-.1539	.1422	-.0566	.2016
Significance	.459	.145	.053	.067	.277	.017
Half or whole day Saturday during school year						
Correlation	.1132	.0363	-.1126	.0111	-.0319	-.0139
Significance	.117	.352	.119	.454	.369	.442
Half or whole day Saturday during summer						
Correlation	.1405	-.1032	-.0057	.0960	-.0567	-.0818
Significance	.070	.140	.476	.157	.276	.196
Week day workshop for one or more days during school year						
Correlation	-.0717	-.0379	.1480	-.0658	.0149	-.0070
Significance	.226	.346	.060	.245	.438	.471
Week day workshop for one or more days during summer						
Correlation	-.1109	.0931	.1305	.0719	-.0947	-.1078
Significance	.122	.164	.085	.226	.160	.129
Programs at Iowa State campus during summer						
Correlation	.1638	.0251	-.0471	.0147	-.0083	-.1653
Significance	.042*	.396	.311	.439	.466	.041*
During summer conference						
Correlation	-.1218	.1018	.0581	-.2259	.0462	.1311
Significance	.100	.143	.271	.008	.314	.084
Southridge Mall in March						
Correlation	-.0425	-.1636	-.0065	-.1368	.2931	.0845
Significance	.328	.042*	.473	.075	.001**	.188

*Significant at the .05 level.

**Significant at the .01 level.

Table 29. Spearman rho correlation of reasons for not attending in-service meetings with length of contract, N=111

	Less than full time	Full time 9 months	Full time 10 months	Full time 11 months	Full time 12 months
Times are not convenient					
Correlation	-.0144	-.0385	.0328	.1735	-.1513
Significance	.440	.344	.366	.034*	.056
Too far to travel					
Correlation	-.0188	.0035	-.0651	.1209	-.0466
Significance	.422	.485	.249	.103	.314
School will not pay expenses					
Correlation	-.0029	.0681	-.0196	.0595	-.0778
Significance	.488	.239	.419	.268	.208
School will not allow paid time off					
Correlation	.1369	.0066	-.0071	.1108	-.1754
Significance	.076	.472	.471	.123	.033*
Inservice topic not relevant					
Correlation	-.0746	-.1538	.1857	.0778	-.0860
Significance	.218	.054	.026*	.209	.185
I feel I keep current myself					
Correlation	.0359	.2495	.0119	-.1724	-.0295
Significance	.354	.004**	.451	.035*	.379
Inservices not well presented					
Correlation	-.0770	-.0860	.0628	.0169	.0297
Significance	.211	.185	.256	.430	.378
I cannot take time away from other duties					
Correlation	-.1394	-.1478	-.0100	-.0398	.2143
Significance	.072	.061	.459	.339	.012*
Teach part-time and cannot take off from other employment					
Correlation	.6413	-.0869	-.1303	-.1523	-.0455
Significance	.000**	.183	.087	.056	.318

*Significant at the .05 level.

**Significant at the .01 level.

Summary

The following section provides a brief summary of the major findings of this study.

1. Teaching experience for secondary instructors ranged from 1 to 34 years with a mean of 13 years. Post-secondary instructors ranged from 1 to 36 years with a mean of 16.3 years.
2. Coaching duties were performed by 14, or 19.2% of secondary instructors, while 26, or 35.1% taught non-agricultural courses. Coaching duties were performed by only 5, or 11.9% of post-secondary instructors, while 17, or 40.5% taught non-agricultural courses.
3. Agricultural instructors who farmed or had part-time work totalled 33, or 44.6% of secondary instructors. An even greater percentage, 21 or 50% of post-secondary instructors farmed or had part-time work.
4. Secondary instructors had accumulated a mean of 21.5 credit hours in the range of 0 to 65 hours. Post-secondary instructors were slightly higher with a mean of 24.1 hours with a range of 0 to 60 credit hours.
5. A t-test of training needs of secondary and post-secondary instructors uncovered significant differences for 12 of the 18 topics under study.
6. A t-test comparing secondary and post-secondary instructors on needs for new teaching materials indicated significant differences for 11 of the 18 topics under study.

7. The top five topics requested by secondary instructors for training sessions were 1) agricultural environmental impact, 2) natural resource management, 3) government policy, 4) impact of global market, and 5) process agricultural products.
8. The top five topics requested by secondary instructors for new teaching materials were 1) agricultural environmental impact, 2) impact global market, 3) process agricultural products, 4) government policy, and 5) natural resource management. These five topics, while in a somewhat different order, were the same as the needs for training.
9. The top five topics requested by post-secondary instructors for additional training were 1) agricultural environmental impact, 2) impact of global market, 3) integrated crop management, 4) government policy, and 5) natural resource management.
10. The top five topics requested by post-secondary instructors for new teaching materials were 1) impact of global market, 2) government policy, 3) agricultural environmental impact, 4) integrated crop management, and 5) natural resource management. While in a somewhat different order these top five topics were the same as their needs for additional training.
11. A clear need was shown for activities and videotapes in all topic areas.
12. Nearly 60% of instructors attended at least 75% of all inservices during the past 3 years.

13. The top four reasons for not attending inservices were 1) times are not convenient, 2) cannot take time from other duties, 3) too far to travel, and 4) inservice topic not relevant. All other reasons for non-attendance were rated quite low.
14. The top three instructor preferences for inservice delivery methods were 1) credit workshop, 2) videotapes, and 3) community college offerings. Fiber optic network, satellite TV and computer networks were rated far below other delivery methods.
15. The top four preferred delivery times were 1) weekday workshops one or more days during summer, 2) during summer conference, 3) 2-3 hour night meeting during school year, and 4) programs at ISU campus during summer. Saturday meetings, either in the summer or during the school year were ranked at the bottom.
16. Significant differences were noted at the .05 level between secondary instructors with 11 to 15 years, and over 26 years teaching experience, in needs for integrated crop management training.
17. Significant differences were noted at the .05 level between less than full time, and full time 12 month secondary instructors, in needs for government policy training.
18. Significant differences were noted at the .05 level between secondary instructors with 11 to 15 years of teaching experience, and those with over 26 years of experience, in needs for teaching materials in integrated crop management.

19. Significant differences were noted at the .05 level between secondary instructors with all levels of teaching contracts, in needs for new teaching materials in agricultural diversification, agriculture power machinery and agricultural construction.
20. Significant differences were noted at the .05 level between secondary instructors at schools with over 1,500 students, with 500 to 749 students and at schools with under 500 students in needs for new teaching materials for ag construction.
21. Instructors with less than full time contracts had a strong correlation coefficient with being unable to take time off from other employment.

CHAPTER V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Statement of the problem

The purpose of this study was to assess the inservice educational needs of Iowa agricultural education instructors. The study was designed to assess possible delivery methods, location, content, and format of future programs as well as needs for curricular materials.

Purpose and objectives of the study

To accomplish the stated purpose of determining the needs of agriculture teachers, the following objectives were established:

1) To determine the needs for additional training in technical skills.

2) To determine the needs for new or additional curriculum materials.

3) To identify the types of curricular materials most needed.

4) To identify reasons for non-participation at inservice programs.

5) To determine instructor preferences in selection of time schedules, location and format of future inservice programs.

6) To determine if there were differences or relationships between teacher needs and selected demographic variables.

Methods and procedures

For this study the sample consisted of two hundred and six instructors drawn from a population of three hundred and twenty-six

secondary and post-secondary agriculture instructors. The questionnaire was developed by the researcher with consultation of colleagues from the Department of Agricultural Education and Studies. The instrument was reviewed for validity and tested for reliability. The questionnaire was checked for reliability and yielded a Cronbach alpha score of .92.

The questionnaire was mailed to the sample, with a follow-up mailing three weeks later. The return rate of one hundred and nineteen (119) questionnaires was fifty-eight percent (58%). Follow-up of nonresponders was conducted with the use of a shortened questionnaire. The first question looking at the needs for additional training and consisted of six topics. A t-test found no significant differences in the respondents needs for training in all six topics. The second question asked for preferred inservice delivery times. Respondents requested two to three hour night meetings during the school year, weekday workshops for one or more days in the summer, and inservices during the summer conference. These responses were the same as those given by all survey respondents, with a changed order. The final question on past inservice attendence was selected as significantly different responses could indicate that not responding to the previous questionnaires was as a result of poor inservice attendance. The instructors responding to this shortened questionnaire reported an attendance level of 3.13, or somewhat less than 50%, this compared with an attendance level of 2.65, or somewhat less than 75% for the instructors who responded to the full questionnaire. Based on these findings the results of this study can be generalized to the population studied. A response rate of fifty-six percent is

considered good for a general mailing (Fuller, 1988; Maclean and Genn, 1979; and Dillman, 1978), and results from that response rate are generalizable to the population. Information from questionnaires was coded and stored on the Iowa State University mainframe computer. Accuracy of coding was verified. Data were analyzed using the Statistical Package for the Social Sciences (SPSS). The statistical procedures used to analyze the data included; frequency counts, percentages, means, standard deviation, oneway anova, non-parametric correlation with Spearman Rho, and t-tests. An 0.05 level of significance was set beforehand for all tests.

Conclusions

Conclusions based on analyses of the data are summarized in six categories:

1) Needs for additional training in technical skills.
2) Needs for new or additional curriculum materials.
3) Types of curricular materials most needed.
4) Reasons for non-participation at inservice programs.
5) Instructor preferences in selection of time schedules, location and format of future inservice programs.
6) Difference between teacher needs and selected demographic variables.

Needs for additional training in technical skills

Results of this study determined that secondary instructors needed inservice training assistance in five topics which were rated at

essentially the same mean. These needs were for training in agricultural environmental impact, natural resource management, government policy, impact of the global market and the processing of agricultural products. These findings were repeated by post-secondary instructors who needed assistance with of four of the same five topics. Post-secondary instructors also needed training in integrated crop management, substituting that for processing agricultural products. The similarity of needs should assist inservice program planners as inservice training modules are developed. Based on these demonstrated needs for inservice training it can also be concluded that environmental concerns are increasing.

Needs for new or additional curriculum materials

Results of this study determined that secondary instructors needed new or additional curriculum materials for the same five topics that they needed inservice training in, these topics were likewise rated at essentially the same mean. The instructors needed teaching materials in agricultural environmental impact, natural resource management, government policy, impact of the global market and the processing of agricultural products. These findings were repeated by post-secondary instructors who needed additional curriculum materials for four of the same five topics, again having a need for integrated crop management rather than for processing agricultural products. This should assist curriculum specialists as they develop materials.

Curricular materials most needed

Secondary instructor needs for new curricular materials were mainly activities and videotapes. Activities or videotapes were requested by at least 47% of respondents for all topics. Lesson plans and background information were somewhat less in demand, while slide materials were in little demand.

Reasons for non-participation at inservice programs

At least three of the four most important reasons for non-attendance at inservice programs are under the control of program planners, with the fourth falling under the control of school administrators. Program planners can control the times so that meetings are convenient, instructors do not have to travel too far, and provide relevant topics as indicated from this study. School administrators can assist with time-off from other duties.

Instructor preferences in selection of time schedules, location, and format of future inservice programs

1. Preferred time schedules show a clear preference for summer delivery times. Weekday workshops one or more days during summer and the summer conference ranked at the top with ratings of 152 and 148. Two to three hour night meetings during the school year were also considered to be acceptable, as were the all day programs on the ISU campus during the summer. Saturday meetings during the school year or in summer were not popular.

2. Preferred locations were Iowa State University campus during the summer conference, or on-campus summer programs and community college offerings. The Southridge Mall March inservice was rated as the least convenient location.

3. The more traditional methods such as credit workshops, videotapes and community college offerings were the most popular with secondary instructors. They rated the more current methods such as the fiber optic network, satellite TV, and computer network programs low. Post secondary instructors were significantly different in their responses as they reported preferences for the fiber optic network, satellite TV, credit workshops and community college offerings. There was a similar preference for community college offerings by instructors from schools with enrollments over 1,500, and instructors from schools with enrollments of 750 to 999 were also significantly different in preference for the fiber optic network. Instructors from schools under 500 showed a preference for videotapes. The size of school and proximity to metropolitan areas might have affected preference for delivery methods.

Difference between teacher needs and selected demographic variables

1. The needs of instructors are similar regardless of where instructors are located or the size of the school. It can be concluded that there is no need to consider different inservice meetings based on school location or size.

2. When comparing the need for additional training, and for new teaching materials, with years taught, a significant difference was found in the needs for additional training and materials in integrated crop management between instructors with 11 to 15 years teaching experience, and those with over 26 years experience. More experienced instructors were more likely to need training and materials in this topic, possibly due to the relatively recent development of this management tool.

3. A comparison of needs for additional training with type of instructor contract found a significant difference in the need for training in government policy between instructors with a part-time contract and instructors with a full time 12 month contract. This could be due to the fact that part-time instructors were working in the field and were more likely to come into contact with government policies than were full time, 12 month instructors.

4. Significant differences were found between the three agricultural mechanization topics and length of instructor contracts and schools size. These differences, while significant, are somewhat hard to quantify and certainly make it difficult to draw any definitive conclusions. Full time 9 month contract instructors had greater needs than instructors with longer contracts, while part-time instructors had lesser needs. There were significant differences between the need for new teaching materials on agricultural construction topics and school size. The smaller and intermediate sized schools had a greater need for teaching materials than did the largest schools.

5. Part-time instructors were most likely to cite time constraints as a reason for not attending inservice meetings.

Recommendations

This research study assessed the needs of agriculture instructors of the state of Iowa. Based upon the findings, the following recommendations are made to those responsible for planning technical inservice update programs and for the development of new curricular materials.

1. Combined inservice programs should be developed for secondary and post-secondary instructors to present technical updates in the following topics: 1) Agricultural environmental impact; 2) Natural resource management; 3) Government policy; and 4) Impact of the global market. Inservice meetings should also be developed for secondary instructors in the processing of agricultural products, while post-secondary instructors need a technical update program in integrated crop management. These last two topics should be offered separately, with the proviso that they are open to all instructors.

2. Curricular materials should be developed for secondary instructors for the following topics: 1) Agricultural environmental impact; 2) Impact of the global market; 3) Processing of agricultural products; 4) Government policy; and 5) Natural resource management. These should be developed and presented when the inservice is conducted as the inservice and curricular needs are the same. Lesson plans, activities, background information and videotapes were all in demand.

Slides were still required by a few instructors. Post-secondary instructors need curricular materials for the following topics: 1) Impact of global markets; 2) Government policy; 3) Agricultural environmental impact; 4) Integrated crop management; and 5) Natural resource management. These should also be developed and presented when the inservice is conducted as the inservice and curricular needs are the same. Lesson plans, activities, background information and videotapes were all in demand. The post-secondary materials can be developed based on the materials for the secondary instructors but will need to expand the level of material and knowledge.

3. New curricular materials, mainly activities and videotapes, should continue to be developed to update all topic areas. Lesson plans and background information, while in somewhat less demand, should also be updated.

4. Administrators and inservice program planners should take the following into consideration when inservice programs are developed. Instructors stated that the two most important reasons for not attending inservices were as follows: 1) Times are not convenient; and 2) I cannot take time from other duties. Inservice programs should be offered to instructors during the summer whenever possible. Weekday workshops of one or more days during the summer and workshops during the summer conference were the most requested times. All day programs on the ISU campus during the summer should also be offered. Two to three hour night meetings during the school year were also considered to be acceptable.

Saturday meetings during the school year or in summer were not popular and should not be planned in the future.

5. Workshop locations should be on the Iowa State University campus and at the community college. Travel distance should be minimized by strategically locating workshops within each district.

6. Inservice programs should be offered as credit workshops, on videotapes and as community college offerings.

7. Educational programs, both preservice and inservice, must be developed that will enhance instructor perceptions, particularly at the secondary level, of the fiber optic network, satellite TV, and computer network programs. Without this enhancement there is little likelihood that instructor participation will occur at inservice programs utilizing these new technologies.

8. How-to-do videotapes should be developed to provide inservice assistance with new teaching materials.

Future Research Questions

1. This research should be continued at reasonable intervals in order to continually serve the agriculture instructors of Iowa with current, needed technical inservice programs. This is also important from the stand-point of maintaining current curricular materials.

2. Research should be conducted to enable the Iowa Department of Education and the Department of Agricultural Education and Studies to better prepare instructors in the new technologies of the fiber optic network, computer network and satellite T.V. as a means of presenting inservice programs.

3. Future research should expand upon the questionnaire used in this study by considering the differing needs of post-secondary instructors in the section dealing with training and teaching material needs. A separate section, with subsections dealing with the different disciplines within agriculture should be utilized.

4. Instructor concerns on self-improvement should be addressed. This questionnaire determined the number of post-graduate credit hours instructors had accumulated but did not determine if the instructor was involved in a program for an advanced degree. Information obtained would allow Iowa State University to better serve the needs of the Iowa agriculture instructor.

5. With the legitimate concerns of more equitable gender distribution questions should be asked dealing with the number of female students in the instructors classroom. Additional research needs to be conducted to determine what recruiting efforts are being made to encourage female student enrollment.

6. The question dealing with the teaching of non-agricultural courses should also be expanded to determine what courses are being taught. This could enable inservice training to incorporate other teaching concepts into the agriculture curricula.

7. A qualitative assessment in the form of focus groups should be conducted, ideally this should be conducted with those instructors not contacted in this study. This would serve two purposes, it could determine any underlying concerns not found in this study, and, secondly, it would enable researchers to compare findings obtained using focus groups with this quantitative, controlled-choice questionnaire.

BIBLIOGRAPHY

Abdul Haq, A. F. M. 1969. Religion in education. Pages 51-69 in A. Al-Muti Sharafuddin, Ed. Education is progress. Proceedings of the symposia East Pakistan education week, 1968. The Star Press, Dacca-1, East Pakistan.

Abolaji, G., and F. W. Reneau. 1988. Inservice needs and problems of agricultural science teachers in Kware State, Nigeria. J. Agric. Ed. 29(3):43-49.

Ag EdS Dept. (Department of Agricultural Education & Studies). 1993. Departmental files, 217 Curtiss Hall, Iowa State University, Ames, Iowa.

Alreck, P. L., and R. B. Settle. 1985. The survey research handbook. Richard Irwin, Inc., Homewood, Ill. 429 pp.

Ary, D., L. C. Jacobs, and A. Razavieh. 1985. Introduction to research in education. Holt, Rinehart and Winston, Inc. Fort Worth, Tex. 449 pp.

Baker, H. R. 1984. The program planning process. Pages 50-64 in D. J. Blackburn, ed. Extension handbook. University of Guelph, Ontario.

Barlow, M. and Staff (Vocational Education Journal staff). 1992. 1917-1992: A vocational education era. Vo. Ed. J. 67(2):30-32.

Barrick, R. K. 1992. Responsibilities of vocational teacher education for Ohio vocational teacher professional development. Pages in J. A. Gamon, ed. Proceedings of the 1992 Central States Education Research Conference, Dept. of Agricultural Education and Studies, Ames, Iowa.

Beetlestone, J., and J. Teasdale. 1984. Awareness of biotechnology in schools. Department of Trade in Industry, London. 57 pp.

Bekkum, V. A., and T. A. Hoerner. 1992. Evaluation of instructional materials packets for Iowa secondary school agricultural education programs. J. Agric. Ed. 33(4):31-38.

Birkenholz, R. J. 1987. Teacher perceptions of factors associated with expanding vocational agriculture programs. J. AATEA 28(2):33-39.

Birkenholz, R. J., and B. R. Stewart. 1991. The use of instructional technologies in Agricultural Education. J. Agric. Ed. 32(2):40-48.

Blackburn, D. J. and D. L. Vist. 1984. Historical roots and philosophy of extension. Pages 1-10 in D. J. Blackburn, ed. Extension handbook. University of Guelph, Ontario.

Bliss, R. K. 1960. History of Cooperative Agriculture and Home Economics Extension in Iowa - The first fifty years. Iowa State University of Science and Technology, Ames, Iowa. 247 pp.

Butler, S. M., M. Sanera, and W. B. Weinrod. 1984. Mandate for leadership II: Continuing the conservative revolution.. The Heritage Foundation, Washington D.C. 566 pp.

Caffarella, R. S. 1982. Identifying client needs. J. Extn. 20(4):5-11.

Daub, L. R. 1990. Student recruitment practices of Iowa high school vocational agriculture instructors. M.S. Thesis, Iowa State University, Ames, Iowa. 173 pp.

Decker, D. J., and W. G. Merrill. 1990. Influencing practices through videotape. J. Extn. 28(1):21-24.

Dillman, D. A. 1978. Mail and telephone surveys. John Wiley & Sons, New York, New York. 325 pp.

Dillman, D. A. 1987. Elements of success. Pages 188-209 in D. E. Johnson and L. R. Meiller, eds. Needs assessment: Theory and methods. Iowa State University Press, Ames, Iowa.

Dormody, T. J. 1993. Prediction modeling of resource sharing between secondary school agriculture teachers and science departments. J. Agric. Ed. 34(1):51-59.

Eckles, S. G. 1987. Perceptions of 1987 Master Gardener participants toward the use of satellite telecommunications for educational/ extension delivery. M.S. Creative Component, Iowa State University, Ames, Iowa

Feuer, D., and B. Geber. 1988. Second thoughts about adult learning theory. Training 88(12):31-39.

Findlay, H. J. 1992. Where do secondary vocational agriculture teachers acquire professional agricultural education competencies? J. Agric. Ed. 33(2):28-33.

Franklin, B. M. 1986. Building the American community: The school curriculum and the search for social control. The Falmer Press, Philadelphia, Penn. 176 pp.

Fuller, F. J., Jr. 1988. Survey research methods. Sage Publications, Inc., Newbury Park, Calif. 159 pp.

Gamon, J. A., I. Mohamed, and L. D. Trede. 1992. Self-perceived orientation training needs of extension professionals in Iowa. J. Agric. Ed. 33(4):24-30.

Gamon, J., and L. Burton. 1987. An evaluation of horticulture in-service instruction in fruit and vegetable production for vocational agriculture teachers. J. Am Assoc Teacher Educators Agric. 28(3):2-15.

Grieshop, J. I., P. S. Bone, and G. W. Frankie. 1990. Bridging gaps between them and us. J. Extn. 28(1):12-15.

Hinkle, D. E., W. Wiersma, and S. G. Jurs. 1979. Applied statistics for the behavioral sciences. Houghton Mifflin, Boston. 490 pp.

Hook, R. 1992. Why ag ed? Vo. Ed. J. 67(6):44.

Hull, D. M. 1991. Tech prep: More than articulation. Vo. Ed. J. 66(4):45-46.

Iowa Department of Education. 1992. Iowa Dept. of Education, Des Moines, Iowa.

Iowa Department of Education. 1990. Iowa agricultural education competency lists. Iowa Dept. of Education, Des Moines, Iowa. 10 pp.

IVATA. 1993. (Iowa Vocational Agriculture Teachers Association). Survey Summary. Okoboji Community School, Milford, Iowa.

Iverson, M.J., D.R. Boreing, B.F. Robinson, and D.R. Carpentier. 1991. A tri-state assessment of current attitudes toward biotechnology held by teachers of agriculture in the public schools. Pages in ed. Proceedings of the eighteenth annual National Agricultural Education Research Meeting. , , .

Johnson, D. E., and L. R. Meiller. 1987. Community level surveys. Pages 126-141 in D. E. Johnson and L. R. Meiller, eds. Needs assessment: Theory and methods. Iowa State University Press, Ames, Iowa.

Kahler, A. 1988. The purpose and delivery of instruction about agriculture. J. Agric. Ed. 29(3):3-11.

Kirby, B. M. 1990. Attitudes, knowledge, and implementation of agricultural science by North Carolina agriculture education teachers. Page 352 in R. Martin ed. Proceedings of the seventeenth annual National Agricultural Education Research Meeting. Iowa State University, Ames, Iowa.

Kirst, M. W. 1984. Who controls our schools? American values in conflict. W. H. Freeman and Company, New York. 183 pp.

Knebel, E. H. and W. Richardson. 1982. Terminology in agricultural education. Dept. of Agricultural Education, Texas A. M. Tex. 22 pp.

Kolb, D. A., and L. H. Lewis. 1986. Facilitating experiential learning: Observations and refelctions. Pages 99-107 in L. H. Lewis, ed. Experiential and simulation techniques for teaching adults. New Directions for Continuing Education, no. 50. Jossey-Bass Inc., Publishers, San Francisco, Calif.

Leuning, R. A., and B. L. Jones. 1989. Characteristics of U.S. farm managers. Pages 12-14 in D. T. Smith ed. 1989 Yearbook of agriculture: Farm management. United States Department of Agriculture, Washington, D.C.

McCaslin, N. L., and R. M. Torres. 1992. Factors underlying agriculture teachers' attitude toward using microcomputers for inservice education. J. Agric. Ed. 33(3):47-52.

McNeil, J. D. 1990. Curriculum: A comprehensive introduction. Scott, Foresman and Company, Glenview, Illinois. 432 pp.

Maclean, M., and H. Genn. 1979. Methodological issues in social surveys. The Macmillan Press Ltd., London and Basingstoke, England. 118 pp.

McKillip, J. 1987. Need analysis: Tools for the human services and education. Applied Social Research Methods Series, Vol. 10. Sage Publications, Inc., Newbury Park, Calif. 143 pp.

Miller, L. E. 1992. Analysis of agriscience teacher inservice needs. A critique. Page 320 in J. P. Mundt, ed. Proceedings of the Nineteenth Annual National Agricultural Education Research Meeting. St. Louis, Missouri.

Mitchell, H. and L. Corby. 1984. Teaching techniques. Pages 79-92 in D. J. Blackburn, ed. Extension handbook. University of Guelph, Ontario.

National Council on Vocational Education. 1990. Occupational competencies: A study of the vocational-technical needs of the agribusiness and chemistry-based technology industries. Published report, Washington, D.C.

Neason, A. 1992. Analysis of the inservice needs of agriscience/ agribusiness teachers for teaching applied agricultural sciences in Louisiana. Louisiana Department of Education, Baton Rouge, Louisiana. 47 pp.

Neason, A. 1992. Analysis of agriscience teacher inservice needs. Pages 312-319 in J. P. Mundt, ed. Proceedings of the Nineteenth Annual National Agricultural Education Research Meeting. St Louis, Missouri.

Nunnally, J. C. 1982. Reliability of measurement. Pages 1589-1601 in H. D. Mitzel, ed. Encyclopedia of educational research. Free Press, New York, New York.

NVATA. 1992. Professional growth series to start in 1993. News & Views 34(3):8.

Odubiyi, A. O. 1988. Perceptions of Iowa vocational agricultural teachers regarding teaching methods used in agricultural education. M.S. Thesis, Iowa State University, Ames, Iowa.

Osborne, E.W., and L.E. Miller. 1985. Livestock skills performance levels reported by agricultural production teachers in Ohio. J. Am Assoc Teacher Educators Agric. 26(3):28-36.

Peasley, D. D., and J. L. Henderson. 1992. Agriscience curriculum in Ohio agricultural education: Teacher utilization, attitudes, and knowledge. J. Agric. Ed 33(1):37-45.

Phipps, L. J., and E. W. Osborne. 1988. Handbook on agricultural education in public schools. The Interstate Printers & Publishers, Inc. Danville, Ill. 593 pp.

Popkewitz, T. S. 1987. The formation of school subjects: The struggle for creating an American institution. The Falmer Press, New York. 310 pp.

Roe, R. G. 1990. A needs assessment of Extension horticulture clients related to educational delivery methods and based on ornamental grass experimental studies. M.S. Thesis. Iowa State University, Ames, Iowa. 91 pp.

Sax, G. 1974. Principles of educational measurement and evaluation. Wadsworth Publishing Company, Inc., Belmont, Calif. 642 pp.

Smith, K. L. 1985. Does in-service make a difference? J. Extn. 23(4):5-7

Smith S. S., and G. L. Roth. 1989. Needs assessment: A planning tool for vocational educators. J. Voc & Tech Ed. 6(1):22-32

Swan, M. K., and R. L. Cole. 1991. Administrator and vocational educator perceptions of summer agricultural program activities. J. Agric. Ed. 32(4):11-18.

Tuckman, B. W. 1988. Conducting educational research. Harcourt Brace Jovanovich, San Diego, Calif. 536 pp.

Weeks, H. P. 1988. Perceptions of selected educators of the quality of instruction in secondary vocational agriculture programs. M.S. Thesis, Iowa State University, Ames, Iowa.

Whent, L. S. 1990. Experimental evaluation of an environmental conservation technology instructional unit. Ph.D Dissertation, Iowa State University, Ames, Iowa. 165 pp.

Wirt, F. M., and M. W. Kirst. 1982. The politics of education: Schools in conflict. McCutchan Publishing Corp., Berkley, Calif. 322 pp.

Zidon, M. G. 1990. Computers in high school agriculture programs: A national study of need, use, and value. M.S. Thesis, Iowa State University, Ames, Iowa. 134 pp.

ACKNOWLEDGEMENTS

My gratitude goes to all the many friends and colleagues who have provided encouragement, assistance, and even the occasional push. My thanks to them all, and in particular to the following people.

To my graduate committee members, Drs. Julia A. Gamon, W. Wade Miller, Nick E. Christians, B. Lynn Jones, and William G. Miller. Dr. Christians and Dr. Gamon have my deepest appreciation for guiding me through two graduate degrees.

A special thank you goes to Susan Lund for the secretarial assistance which gave me the time for other endeavours.

To my parents, James Eric and Irene Joan Roe, my continuing gratitude for their lifelong care, concern, and love.

To my family, Zsuzsanna Maria who brought joy and love to my life, and who provided the encouragement and support needed in these writings. This degree is truly ours. Also to six very special children Sara, Angela, Eric, Alison, Kriszti, and Dorka.

APPENDIX

Table 30. Planned participation in FFA leadership contests in 1992-93

Job interview	56
Freshman creed speaking	55
Ag broadcasting/journalism	50
Conduct of meetings	48
Ag sales leadership	47
Parliamentary procedure	42
Extemporaneous speaking	35
Public speaking	34
Treasurer's record book	21
Reporter's scrap book	17
Secretary's scrap book	17
Chapter program of activities	14
Chapter activity exhibit	11

Table 31. Planned participation in FFA ag knowledge and skill contests in 1992-93

Soil	52
Livestock	51
Farm management	42
Ag mechanics	27
Meats	27
Horse	24
Dairy cattle	22
Floriculture	20
Dairy foods	19
Ag commodities and marketing	18
Ag sales	18
Nursery landscape	16

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF EDUCATION
WILLIAM L. LEPLEY, ED.D., DIRECTOR

January 14, 1993

Dear Fellow Agricultural Educator:

The information provided by you on the enclosed questionnaire will be the basis for future inservice program offerings for agricultural education teachers in Iowa. Your responses will help in determining the format and content of inservice programs in the State for the next two or three years. This information will allow future inservice offerings to more closely fit the format and content that will be the most useful to you.

The information you provided will be held in strict confidence, combined with other responses, and reported only in group summary form. The identification number on the last page will be used to track responses. After it is determined that questionnaires have been returned, the identification number will be removed. Please be aware that you are free to withdraw your participation in this survey at any time.

Thank you for taking the time, about 15 minutes, to complete this questionnaire; we plan to use your suggestions to assist us in the planning of future inservice programs. This questionnaire is addressed and stamped. You should fold the questionnaire and fasten with tape or a staple. If you have any questions, please contact Dr. Julia Gamon or Roger Roe at Iowa State University, phone number (515) 294-5872.

Sincerely,

BUREAU OF TECHNICAL AND VOCATIONAL ED.

Alan L. O'Neal

Alan L. O'Neal
Agricultural Education Consultant

/ts

TECHNICAL UPDATE INSERVICE EDUCATION NEEDS FOR 1993 & BEYOND

129

PLEASE READ CAREFULLY

The purpose of this needs assessment is to allow the Iowa Department of Education and Iowa State University to determine priorities for your inservice education during the next few years. Your responses on program content and delivery are important.

The results will provide a profile of inservice education needs. This is only one of the many considerations that will be used to determine what teacher development opportunities should be offered.

Definition of Need: Please use the following definition of a need, "the discrepancy between an existing state and a desired state".

Example Section: General Perceptions of Inservice.

INSTRUCTIONS: Circle the number of your response as follows:

1	2	3	4	5
Not important	Somewhat important	Important	Very important	Extremely important

1.	How important is it for inservice training to focus on keeping teachers technologically current?	1	2	3	4	(5)
2.	It is important that I be paid for attending.	1	2	3	(4)	5

Secondary Agriculture Teachers: Please Respond To All Four Sections.

Post Secondary Agriculture Teachers: Please Respond To The First Three Sections Only.

Section 1: Need for Additional Training and Teaching Materials.

INSTRUCTIONS: In column (A) circle the number which indicates your need for additional training in each topic. In column (B) circle the number which indicates the need for additional teaching materials on each topic.

1	2	3	4	5
Not important	Somewhat important	Important	Very important	Extremely important

In column (C) indicate teaching materials needed:
P Lesson Plans A Activities I Background Information S Slides V Videos

(A) Additional Training	Topic	(B) New Teaching Materials	(C) Materials Needed				
			P	A	I	S	V
1 2 3 4 5	Agri Business	1 2 3 4 5	_	_	_	_	_
1 2 3 4 5	Agri Service	1 2 3 4 5	_	_	_	_	_
1 2 3 4 5	Agri Supply	1 2 3 4 5	_	_	_	_	_
1 2 3 4 5	Crop Production	1 2 3 4 5	_	_	_	_	_
1 2 3 4 5	Animal Production	1 2 3 4 5	_	_	_	_	_
1 2 3 4 5	Ag Diversification	1 2 3 4 5	_	_	_	_	_
1 2 3 4 5	AgPower Machinery	1 2 3 4 5	_	_	_	_	_
1 2 3 4 5	Ag Construction	1 2 3 4 5	_	_	_	_	_
1 2 3 4 5	AgWelding Metal Wood	1 2 3 4 5	_	_	_	_	_
1 2 3 4 5	Landscape Turfgrass	1 2 3 4 5	_	_	_	_	_
1 2 3 4 5	Nursery Greenhouse	1 2 3 4 5	_	_	_	_	_
1 2 3 4 5	Fruit Vegetable	1 2 3 4 5	_	_	_	_	_
1 2 3 4 5	Process Ag Products	1 2 3 4 5	_	_	_	_	_
1 2 3 4 5	Impact Global Market	1 2 3 4 5	_	_	_	_	_
1 2 3 4 5	Government Policy	1 2 3 4 5	_	_	_	_	_
1 2 3 4 5	Ag EnvironmentImpact	1 2 3 4 5	_	_	_	_	_
1 2 3 4 5	Integrated Crop Mgmt	1 2 3 4 5	_	_	_	_	_
1 2 3 4 5	NaturalResource Mgmt	1 2 3 4 5	_	_	_	_	_

Section 2: General Perceptions of Inservice.

1. Please indicate which three of the following are the most convenient inservice delivery methods by ranking your first three choices 1, 2, & 3.

   1.___ Videotapes
   2.___ Fiber optic network (If your school can be connected)
   3.___ Satellite T.V.
   4.___ Computer network
   5.___ Credit workshop
   6.___ Community college offerings

2. Please indicate which three of the following are the most convenient inservice delivery times by ranking your first three choices 1, 2, & 3.

   1.___ 2-3 hour night meeting during school year
   2.___ 2-3 hour night meeting during summer
   3.___ Half or whole day program on Saturday during school year
   4.___ Half or whole day program on Saturday during summer
   5.___ Weekday workshop for one or more days during school year
   6.___ Weekday workshop for one or more days during summer
   7.___ Programs at Iowa State campus during summer
   8.___ During summer conference
   9.___ Southridge Mall in March

3. Please indicate your attendance at inservice education meetings the last three years, or since you started teaching. Check the best response.

   1.___ 100% attendance
   2.___ 75% attendance
   3.___ 50% attendance
   4.___ 25% attendance
   5.___ Never attended

4. What were the reasons for not attending? Please select your most frequent reasons for not attending by ranking them 1, 2, and 3.

   1.___ Times are not convenient
   2.___ Too far to travel
   3.___ School will not pay expenses
   4.___ School will not allow paid time off
   5.___ Inservice topic not relevant
   6.___ I feel that I keep current myself
   7.___ Inservices not well presented
   8.___ I cannot take time away from other duties
   9.___ Teach part-time & I cannot take off from other employment
   10.___ Other (Specify)_____

5. In which of the National Council Professional Growth Series do you most need inservice training? Please rank by marking them 1, 2, 3, 4, and 5.

   1.___ Ag Sales
   2.___ Food Science and Safety
   3.___ Agricultural Issues
   4.___ Maximum Economic Yield
   5.___ No-Till Agriculture

Section 3: Demographics & General Comments.

6. Do you teach in more than 1 school? ___Yes ___No

7. What is your contract?

1.___ Less than full time
2.___ Full time 9 months
3.___ Full time 10 months
4.___ Full time 11 months
5.___ Full time 12 months

8. In which district is your school located?

1.___ NE 4.___ SE
2.___ NC 5.___ SC
3.___ NW 6.___ SW

9. What is the size (K-12) of your school district, or combined districts, or do you teach post secondary?

1.___ Post Secondary
2.___ More than 1,500
3.___ 1,000-1,499
4.___ 750-999
5.___ 500-749
6.___ Under 500

10. Total number of years you have taught agriculture? _____

11. Are you a member of IVATA? ___Yes ___No

12. Do you teach courses other than agriculture? ___Yes ___No

13. Do you coach? ___Yes ___No

14. Do you farm or have other part-time work? ___Yes ___No

15. How many post graduate credit hours do you have? _____

16. Your gender is: ___Female ___Male

17. Please tell me if I have not covered a topic that would be of interest to you. _____

_____

_____

_____

Section 4: Participation in FFA Contests.

18. How many FFA Ag Knowledge Skill Contests did your department participate in 91-92? ____

19. How many FFA Leadership contests did your department participate in 91-92? ____

20. Please check each Ag Knowledge and skill contest that you plan to participate in this year (92-93).

1.___ Farm Management
2.___ Ag Mechanics
3.___ Horse
4.___ Ag Sales
5.___ Floriculture
6.___ Soil
7.___ Nursery/Landscape
8.___ Livestock
9.___ Meats
10.___ Dairy Cattle
11.___ Dairy Foods
12.___ Ag Commodities & Marketing

21. Please check each Leadership contest that you plan to participate in this year (92-93).

1.___ Chapter Program of Activities
2.___ Freshman Creed Speaking
3.___ Extemporaneous Speaking
4.___ Ag. Broadcasting/Journalism
5.___ Parliamentary Procedure
6.___ Chapter Activity Exhibit
7.___ Treasurer's Record Book
8.___ Ag Sales Leadership
9.___ Job Interview
10.___ Conduct of Meetings
11.___ Public Speaking
12.___ Reporters Scrapbook
13.___ Secretary's Record Book

THANK YOU FOR YOUR COOPERATION

PLEASE RETURN BY FEBRUARY 28, 1993

PLEASE FOLD AT THE MIDPOINT OF THE QUESTIONNAIRE
SO THAT THE
RETURN ADDRESS SHOWS.

PLEASE STAPLE OR TAPE SHUT.

POSTAGE IS ATTACHED.

Agricultural Education & Studies
Room 217, Curtiss Hall
Iowa State University
Ames, Iowa 50011

ROGER G. ROE
ROOM 217, CURTISS HALL
IOWA STATE UNIVERSITY
AMES, IOWA 50011

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

135

Department of Agricultural Education and Studies
201 Curtiss Hall
Ames, Iowa 50011-1050
Administration and Graduate Programs 515 294 [illegible]
Research and Extension Programs 515 294 [illegible]
Undergraduate Programs 515 294-6024

February 15, 1993

Dear Agricultural Educator:

About three weeks ago a questionnaire seeking your opinion about Technical Update Inservice needs was mailed to you. As of today we have not received your completed questionnaire.

Your responses are important as they will be used in determining both program content and delivery method. The Department of Education will use the survey results to set priorities for your inservice education in the future.

I am writing to you again because of the significance each questionnaire has to the usefulness of this study. Because it has only been sent to a sample of Iowa instructors it is extremely important that yours also be included in the study if the results are to accurately represent the opinions of Iowa instructors. If you have already completed and returned it to us please accept our sincere thanks. If not, please do so today.

In the event that your questionnaire has been misplaced, a replacement is enclosed. If you have any questions or concerns please call us at (515) 294-0897.

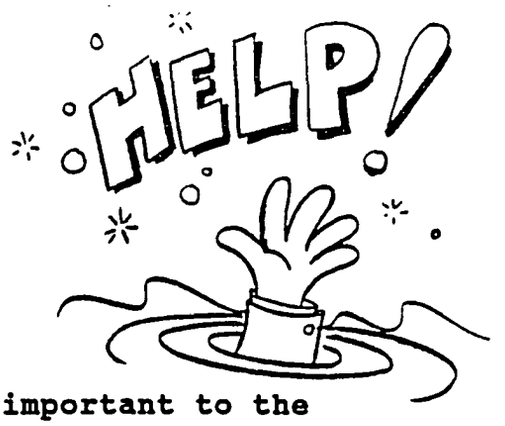
Your cooperation is greatly appreciated.

Cordially,

Roger Roe
Research Associate

Julia Gamon
Associate Professor

P.S. A number of respondents have made many useful comments on their questionnaires. We hope to start implementing some of these suggestions in the near future.



PLEASE HELP!!!! Several weeks ago I mailed you a questionnaire. I expect that like most of us you have been too busy and have not had the time to complete it. With the FFA competitions over would you please take a few minutes and answer this shortened questionnaire.

Your responses to these questions are vitally important to the success of this survey.

1. Circle the number which indicates your need for additional training in each topic.

1	2	3	4	5
Not important	Somewhat important	Important	Very important	Extremely important

Topic	Additional Training				
Agri Business	1	2	3	4	5
Ag Diversification	1	2	3	4	5
Ag Construction	1	2	3	4	5
Landscape Turfgrass	1	2	3	4	5
Impact Global Market	1	2	3	4	5
Natural Resource Mgmt	1	2	3	4	5

2. Please indicate which three of the following are the most convenient inservice <u>delivery times</u> by ranking your <u>first three choices</u> 1, 2, & 3.

1.___ 2-3 hour night meeting during school year
2.___ 2-3 hour night meeting during summer
3.___ Half or whole day program on Saturday during school year
4.___ Half or whole day program on Saturday during summer
5.___ Weekday workshop for one or more days during school year
6.___ Weekday workshop for one or more days during summer
7.___ Programs at Iowa State campus during summer
8.___ During summer conference
9.___ Southridge Mall in March

3. Please indicate your attendance at inservice education meetings the last three years, or since you started teaching. <u>Check the best response</u>.

1.___ 100% attendance
2.___ 75% attendance
3.___ 50% attendance
4.___ 25% attendance
5.___ Never attended

Please return this short questionnaire as soon as possible, your prompt response is greatly appreciated. If you have any concerns please call 515 294-0897.
Please return in the enclosed envelope to:
Roger Roe
217 Curtiss Hall, Iowa State University
Ames, Iowa 50011

Information for Review of Research Involving Human Subjects

Iowa State University

(Please type and use the attached instructions for completing this form)

1. Title of Project A Needs Assessment of Iowa Agriculture Teachers for Inservice Training

2. I agree to provide the proper surveillance of this project to insure that the rights and welfare of the human subjects are protected. I will report any adverse reactions to the committee. Additions to or changes in research procedures after the project has been approved will be submitted to the committee for review. I agree to request renewal of approval for any project continuing more than one year.

Roger G. Roe	17 November 1992	Roger G. Roe
Typed Name of Principal Investigator	Date	Signature of Principal Investigator

Agricultural Education & Studies	217 Curtiss	4-0401
Department	Campus Address	Campus Telephone

3. Signatures of other investigators

	Date	Relationship to Principal Investigator
Julia Gamon Julia Gamon	17 Nov 92	Major Professor
J		

4. Principal Investigator(s) (check all that apply)
☒ Faculty ☐ Staff ☒ Graduate Student ☐ Undergraduate Student

5. Project (check all that apply)
☒ Research ☒ Thesis or dissertation ☐ Class project ☐ Independent Study (490, 590, Honors project)

6. Number of subjects (complete all that apply)
150 # Adults, non-students ___ # ISU student ___ # minors under 14 ___ # minors 14 - 17 ___ other (explain)

7. Brief description of proposed research involving human subjects: (See instructions, Item 7. Use an additional page if needed.) A needs assessment of Iowa vocational agriculture high school teachers to determine needs and preferred format for inservice training. This will be conducted by use of a questionnaire to be mailed by the Iowa Department of Education. Subjects will be randomly selected from all the agriculture teachers in Iowa high schools. Age and sex will vary from school district to district. All will be adult.
No incentives or compensation will be offered. Follow-up techniques used will be consist of postcards, a second mailing of questionnaires, and telephone calls.

(Please do not send research, thesis, or dissertation proposals.)

8. Informed Consent:
☐ Signed informed consent will be obtained. (Attach a copy of your form.)
☒ Modified informed consent will be obtained. (See instructions, item 8.)
☐ Not applicable to this project.

Cover letter stating modified informed consent is included.

Checklist for Attachments and Time Schedule

The following are attached (please check):

12. [X] Letter or written statement to subjects indicating clearly:
    a) purpose of the research
    b) the use of any identifier codes (names, #'s), how they will be used, and when they will be removed (see Item 17)
    c) an estimate of time needed for participation in the research and the place
    d) if applicable, location of the research activity
    e) how you will ensure confidentiality
    f) in a longitudinal study, note when and how you will contact subjects later
    g) participation is voluntary; nonparticipation will not affect evaluations of the subject

13. [ ] Consent form (if applicable)

14. [ ] Letter of approval for research from cooperating organizations or institutions (if applicable)

15. [X] Data-gathering instruments

16. Anticipated dates for contact with subjects:
    First Contact December 1992 (Month / Day / Year)
    Last Contact January 1993 (Month / Day / Year)

17. If applicable: anticipated date that identifiers will be removed from completed survey instruments and/or audio or visual tapes will be erased:
    January 1993 (Month / Day / Year)

18. Signature of Departmental Executive Officer [signature] Date 1-22-93 Department or Administrative Unit Ag Ed S

19. Decision of the University Human Subjects Review Committee:

    X Project Approved ___ Project Not Approved ___ No Action Required

    Patricia M. Keith (Name of Committee Chairperson) 1/28/93 (Date) [signature] (Signature of Committee Chairperson)

GC:1/90